THE USE OF TOKEN REINFORCEMENT TO FACILITATE A THERAPEUTIC
STYLE OF VERBAL INTERACTION IN GROUPS OF
PSYCHIATRIC PATIENTS

by

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Henry G. Martin
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ABSTRACT

The Use of Token Reinforcement to Facilitate a Therapeutic
Style of Verbal Interaction in Groups of
Psychiatric Patients

by

Henry G. Martin, Doctor of Philosophy
Utah State University, 1974

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Department: Psychology

This study evaluated the use of a token, operant conditioning
technique as a treatment procedure in a group setting with chronic,
hospitalized, psychiatric patients. Fifteen patients were randomly
assigned to two experimental groups and to one control group; each
group included five patients. The two experimental groups received
tokens during phases of contingent reinforcement for "Therapeutic
Responses" and under a yoked-control phase of non-contingent token
reinforcement; the sequence of these phases was the major difference
between the two experimental groups. The control group met under con-
ditions of no tokens, and the frequency of "Therapeutic Responses" was
recorded on those subjects.

"Therapeutic Responses" were characterized as open, confrontive,
and problem-solving oriented interaction among group members as defined
by Quadrant IV of the Hill Interaction Matrix (HIM).

Results clearly supported the hypotheses that therapeutic responses
did occur significantly more frequently and for longer durations in
both the experimental groups in the following predicted directions: (1) under conditions of contingent token reinforcement as compared to conditions of non-contingent token reinforcement and to baseline and extinction phases; (2) in both of the experimental groups as compared to the control group. Reversal procedures demonstrated the expected extinction effects.

Also, all three groups were compared on follow-up outcome data which included: (1) pre- and post-test ratings by hospital attendants of the group member's behavior changes on the ward as measured by The MACC Behavioral Adjustment Scale; (2) pre- and post-test scores on the HIM-B (an unpublished instrument based on the HIM measuring attitudes toward group interaction). There were no differential effects among the three groups' MACC Behavioral Adjustment Scale and HIM-B post-test scores.

These results were discussed in respect to the implications of applied research in the area of verbal conditioning, and implications for the treatment of chronic psychiatric patients. Recommendations for future research to examine possible generalization effects were offered.
Chapter I

Introduction

Statement and delimitation of the problem

The present study is an attempt to use a token, operant conditioning technique as a treatment procedure in a group setting with chronic, hospitalized, psychiatric patients.

Psychotherapeutic practice is presently undergoing a rather remarkable re-evaluation owing to results being reported by researchers utilizing techniques based on modern learning theory. In practice and research, methods based on operant conditioning theory have been devised to modify many kinds of unadaptive behavior, and a growing body of literature attests to their efficacy and to their value as objective, replicable, and measurable agents of change.

Previous research indicates that conditioning of verbal behavior offers further support to a learning theory interpretation of changes that may occur during individual and group psychotherapy. This type of technique allows for descriptive specificity and thereby enables a more precise cause and effect relationship to be explored in the interpersonal process of therapy. The verbal conditioning paradigm has been demonstrated to be an effective tool in the experimental analysis of verbal behavior. The present study was an attempt to extend the parameters of the type of verbal behavior which can be conditioned with a population that is typically non-verbal.
Verbal conditioning. Krasner defined verbal conditioning as the "systematic application of social reinforcement to influence the probability of another person emitting a specifiable verbal behavior." (Krasner, 1965, p. 213)

Many reviewers (Krasner, 1958; Strong, 1964; Williams, 1964; Krasner, 1965; Kanfer, 1968) have documented the transition of Skinnerian operant conditioning procedures from simple laboratory animal learning to simple laboratory verbal learning experiments with humans to the more complex applied problems such as are found in individual and group therapy settings. It has been demonstrated that verbal conditioning is an effective way of changing verbal behavior within an interpersonal situation; how to use verbal conditioning as a legitimate treatment technique needs further exploration and clarification.

Verbal conditioning research stages. Kanfer (1968) has presented a historical sketch of the trend of verbal conditioning research through four stages: (1) demonstration, (2) re-evaluation, (3) application and (4) expansion.

Kanfer indicated that studies during the "demonstration stage" (early 1950's) chiefly attempted to "demonstrate that various modifications of the basic operant conditioning paradigm can be fruitfully applied to human behavior and that response classes of varying complexity are sensitive to reinforcing operations" (Kanfer, 1968, p. 256). Experiments during this stage were primarily concerned with demonstrating that the Skinnerian S-R paradigm could be applied with some success to human behavior (usually verbal). Many of the studies in this demonstration stage used simple verbal reinforcers such as
"uhmm" or "good" and relatively simple response classes for dependent variables such as "personal pronouns." Greenspoon (1951, 1955), for example, was able to demonstrate that four different reinforcements, verbal approval and disapproval, a light and a tone, changed the probability of a response class of plural nouns.

Kanfer indicated that during the "re-evaluation" stage the realization was that in the field of verbal conditioning experimental results were highly sensitive to and affected by a much wider variety of variables than previously had been expected. Findings of large variability among subjects in group data suggested that a subject's performance may be affected by many variables such as: (1) his past experiences, (2) his attitudes toward the experimenter, (3) his familiarity with the task material or the desired response class, and (4) his style of approaching new or problem-solving situations. It became apparent that differences in the task variables, reinforcing stimuli, social or experimental setting, and subject populations made a difference in the results obtained.

The application stage includes those investigations that have used verbal conditioning techniques and methodology as tools for evaluating hypotheses about social behavior, personality, clinical procedures, and so forth. Since the verbal conditioning methods represent a close laboratory analogue to the clinical interview, counseling interview and other psychotherapeutic procedures, and since the experimental purposes of many verbal conditioning studies closely parallel one of the by-products of interview therapies (i.e., changing the verbal behavior of the subject or client), the utilization of verbal conditioning techniques increasingly became an actual treatment procedure.
Several studies have had as their goal the testing of (1) the effectiveness of various clinical or counseling procedures, (2) the modification of interview behavior, (3) and group therapy behavior or small group interaction (Roffer, 1969; Hellervick, 1969; Alumbaugh, 1971; Hauserman, 1972; and others). Research studies within the "application stage" have also focused on the applicability of verbal conditioning techniques in the modification of different verbal response classes such as plural pronouns, hostile or non-hostile verbs, emotional or neutral words, socially acceptable or non-acceptable words, self or other reference statements and many others. During the last stage, the expansion stage, researchers are attempting to resolve issues between behavioristic and cognitive learning theories by modifying the original paradigms of such phenomena as vicarious learning, the role of awareness in learning, self-reinforcing variables, and mediational processes.

Kanfer's four stages have been summarized in order to present the developmental context of the present study. This study fits best into the "application stage" of verbal conditioning.

Summary of research contributing to this investigation

There were three general areas of research that led up to the formation and design of this study: group counseling and the conditioning of verbal responses in groups; conditioning of verbal behavior among schizophrenic patients; and categorizing and facilitating therapeutic interaction in individual and group therapies.

Group research. The group psychotherapy literature has grown considerably during the past twenty-five years. Major portions of the literature have been theoretical expositions; however, recently experiential and anecdotal accounts of the whole encounter group
phenomenon have become popular. Research studies have for the most part focused on adopting traditional techniques such as: psychoanalysis, client-centered therapy, psychodrama, operant techniques, and so forth, to the group setting. Generally these studies have attempted to compare these various approaches with different target populations, and on selected outcome measures. The actual procedures used have usually been inadequately described and there has been very little specificity or resemblance of an independent and dependent variable. Pattison's (1966) perusal of the six major volumes reviewing psychotherapy research during the period from 1956 to 1965 revealed only six references to evaluative studies on group psychotherapy that had any semblance of a research design (i.e. control group, before and after measures, etc.).

Recent reviews of articles (MacClellan and Levy, 1970, 1971; Lubin, Lubin, and Sargeant, 1972) generally reflect correlative research at best. Few give any specific procedural steps or constructive criticism to aid future investigators. Also, the researchers have not been specific about the important variables in their research studies; and generally the conclusions are either ambiguous or confusing. It is usually difficult to know to what the reported outcomes and results can be attributed.

Even though the development of group methods goes back to 1906 and that of group psychotherapy to 1931 (Moreno, 1967), verbal operant conditioning had not been used as a treatment technique in the group setting until the early 1960's (Dinoff, et al., 1960; Rickard and Timmons, 1961; Ullmann, Krasner, and Collins, 1961).

Recent research has directed attention toward manipulating the groups behavior toward specific styles of interaction, and/or increasing
the frequency of verbalizations with typically non-verbal psychiatric patients. Roffer (1969) successfully used a reinforcing procedure with college counseling groups to teach open and confrontive verbal interaction in counseling groups. Similar procedures were used by Hellervick (1969) to condition confrontive verbal behavior between a counselor and his client. Further, Alumbaugh (1971) used token reinforcement procedures with chronic psychiatric patients to increase their social responses with other group members and the group therapist. Hauserman, et. al., (1972) used token reinforcement with six hospitalized adolescents to increase their emission of verbal initiations in group therapy.

In summary, recent research indicates the increased usage of operant conditioning techniques as a legitimate treatment technique in group settings; however, further applied research is necessary in order to discover the parameters of what types of verbal behaviors can be conditioned in what types of groups.

Behavior therapy with schizophrenics. Other operant conditioning treatment procedures, not directly dependent upon verbal conditioning, have been called the "behavior therapies." Several classic studies have demonstrated behavioral control with chronic schizophrenic patients. In a remarkable experiment, Isaacs, et al. (1960) applied operant conditioning techniques to reinstate verbal behavior in two mute catatonic males who had not emitted verbal responses for over 14 years. Ayllon and Haughton (1964) demonstrated that when ward staff withheld social reinforcement (extinction) it resulted in a decrease in the frequency of psychotic speech of institutionalized patients. In a series of studies, Ayllon and Azrin (1965) set up a token economy on a ward of 45 female schizophrenic patients. They demonstrated that by secondary
reinforcement (i.e. tokens) they could increase adaptive behaviors of psychotic patients in a quasi real-life situation. The interested reader is referred to other sources that review the extent of use of behavior therapy on chronic institutionalized psychiatric patients (Lindsley, 1956; Yates, 1970).

Earlier studies have explored the difficulties and possibilities of conditioning the verbal behavior of schizophrenic patients. Experiments have been set up to examine the feasibility of reinforcing the verbal behavior of patients in real and in quasi-therapeutic situations. A series of studies by Salzinger and his colleagues have examined the effects of reinforcement on the verbal behavior of schizophrenics in an interview type of situation. These studies have demonstrated that the output of verbal affect in schizophrenics can be manipulated by the use of questions as discriminative stimuli (Salzinger, 1956) and by the use of verbal reinforcement (Salzinger and Pisoni, 1960). Other findings indicated that schizophrenic patients have less resistance to extinction than have normal individuals (Salzinger and Pisoni, 1960b); and that patients who condition have a better prognosis (6-month follow-up) than patients who do not condition (Salzinger and Pisoni, 1960a). They have also demonstrated that a reinforcement technique of light flashing feedback can be used to manipulate continuous speech in schizophrenic patients (Salzinger, et. al., 1964).

Limited research has been reported on the use of conditioning techniques on the verbal interactions in group therapy. Dinoff, Horner, Kurpiewski, and Timmons (1960) classified the verbalizations during group therapy of chronic male schizophrenics into five categories and
found that differential reinforcement significantly affected verbal output. However, in both this and a subsequent study (Dinoff, Horner, Kurpiewski, Rickard, and Timmons, 1960) the results were transient and did not carry over from the training session to a test session without reinforcement. Ullmann, et al. (1961) did, however, find that a group provided with positive personal reinforcement during group therapy showed a significant rise on a Group Therapy Scale (as rated by a psychiatrist) compared with two other groups not given reinforcement.

Salsberg’s (1961) study indicated that there was an inverse relationship between the amount of therapist talk and the amount of group interaction with 25 male inpatients. Heckel, et al. (1962) in a group therapy with male patients, conditioned against silences by use of an unpleasant auditory stimuli contingent upon the silence. Wagner (1966) significantly increased verbal productivity in a group of psychiatric subjects with social reinforcement. Lapuc and Harmatz (1970) conditioned positive self-reference statements in a group of patients; their results demonstrated conditioning, however, they were unable to show any generalization effect on behavior ratings and a number of personality measures. Token reinforcement procedures were used in a group of chronic psychiatric patients to increase the number of social responses between patients and the therapist (Alumbaugh, 1971).

In summary, these studies indicate the potential for future research to continue to apply and explore the limits of other verbal behaviors that may be conditioned with chronic schizophrenic patients.

Definition of "Therapeutic Response" - a class of verbal behavior. One of the necessary research prerequisites of this study was to decide
upon a categorization tool that could reliably measure a chosen style of
group interaction deemed to have therapeutic benefit.

Previous research in this area of verbal conditioning has chosen
target verbalizations such as "verbal initiations," self-reference
statements, answers to questions, modification of delusional behavior,
verbal productivity, and so forth.

One of the best examples of an empirically developed categorization
technique specifically developed for therapeutic groups is the Hill
Interaction Matrix (Hill, 1961, 1965, 1971). During the development of
the Hill Interaction Matrix (referred to as the HIM) certain kinds of
verbal behavior impressed Hill as having more therapeutic potential than
others. The HIM defines four topics that may occur in groups: i.e.
topic oriented, group oriented, personal referenced statements, and
relationship referenced statements. Also, the HIM defines five styles
of group interaction: i.e. responsive, conventional, assertive, specu-
lative, and confrontive statements. Those verbal behaviors that are
considered by Hill to be at the highest therapeutic work level fall into
Quadrant IV of the matrix. This quadrant includes either a Speculative
or Confrontive style of interaction on topics of either a personal or
interpersonal nature. For further description of the HIM see
Chapter III.

One of the contentions made by Hill is that group therapy practice
should move to the point of a science; Hill (1971) suggested the use of
systematic feedback on the style of interaction functioning within a
group could have utility and lead to better therapy for the group.
Studies by Roffer (1969), Hellervick (1968), and Lee (1968) all have
indicated that subjects can be modified behaviorally to operate at
higher HIM levels (i.e. in Quadrant IV). Yalom, Houts, Newell, and Rand's (1967) study indicated that group members do operate at higher HIM levels when given some orientation prior to participating in a therapy group.

Restatement and justification of the research problem

One of the common problems with chronic, hospitalized schizophrenic patients is that they are typically non-verbal, or when they do verbalize, it is at a shallow, responsive, non-problem-solving level. Previous research has demonstrated that the verbal behavior of schizophrenics can be modified.

Research with the HIM has demonstrated its reliability of classifying and pinpointing "therapeutic interaction," and research has indicated significant results in modifying groups of college students and other normal subjects to verbalize at higher HIM levels (Hellervick, 1968 and Roffers, 1969). However, no research has modified a group of schizophrenics to verbalize at higher HIM levels.

The problem of the present study is that there is no research that has applied operant conditioning techniques to condition the verbal behavior of a group of schizophrenic patients to interact at a higher functioning therapeutic level (as defined by the HIM).

A major objective of the present study was to use token reinforcement as a treatment technique to operant condition the therapeutic interaction in a group therapy setting of schizophrenic patients.

The study can be justified from several perspectives. First, it is a further extension of the "application stage" of research on verbal conditioning. This study will attempt to demonstrate the modification
of a verbal response class (i.e. high HIM level) with subjects (i.e. chronic, psychiatric patients) with whom this verbal response class is atypical.

Second, this study has potential significance in that it broadens the spectrum of how behavior therapy (i.e. token reinforcement) can be used in the treatment of psychiatric patients.

Third, this study has potential significance in the area of group therapy. It may demonstrate a means of facilitating higher therapeutic interaction in group therapy with persons who are typically beyond the realm of being involved in "talk" therapies.

Definition of terms

The following terms and abbreviations are used frequently throughout the present study.

**ABA experimental design.** The paradigm of most operant behavior research employing an intra-subject replication design (often called the reversal design), in which various treatments are successively applied to and removed from the same subject (Sidman, 1960).

**Baseline.** The phase of the experiment when the initial operant level of a target response is determined.

**Contingent reinforcement.** When rewards (or tokens) are given conditional upon the occurrence of the target response, and the appropriate response patterns are exhibited at a consistently high level (Bandura, 1969).

**Extinction.** No consequence that earlier functioned as a reinforcer follows the response. During periods of extinction the frequency of the response will return to (or approach) the initial operant level.
HIM. The Hill Interaction Matrix was developed by William F. Hill and Ida S. Hill to rate the verbal interaction of therapy groups.

HIM-B. An unpublished instrument developed by William F. Hill and based on the HIM; it was designed to measure a person's interaction preferences in groups.

MACC Behavioral Adjustment Scale. A rating scale used by ward nurses and attendants to measure the typical ward behavior of hospitalized psychiatric patients; it was developed by Robert B. Ellsworth (1957). MACC stands for the four obtained scores: motility, affect, cooperation, and communication.

Noncontingent reinforcement. When rewards (or tokens) are given, but after a certain time has elapsed, independent of the subject's behavior, there is usually a marked drop in the frequency of the target response (Bandura, 1969).

Talk response. Verbal initiations of three or more continuous words.

Target response. In the present study "Therapeutic Responses" were chosen as the responses to be operantly conditioned.

Therapeutic Responses. Verbal responses as categorized by Quadrant IV of the Hill Interaction Matrix; these type of responses are oriented to a problem-solving style of interaction.

Tokens. Tangible stimuli used to bridge the delay between a response and a reinforcer. Usually poker chips or metal slugs are used as tokens; they can be spent to buy cigarettes, candy, and other types of rewards.
Yoked-control technique. A procedure used to insure that the number of tokens, and the duration between tokens dispensed in a non-contingent reinforcement phase approximates that in a contingent reinforcement phase.
CHAPTER II

REVIEW OF LITERATURE

This review of literature will focus primarily on methodological considerations of research on verbal conditioning from three overlapping perspectives: (1) Verbal conditioning studies in laboratory and experimental settings; (2) Verbal conditioning process studies in counseling and/or psychotherapy groups; (3) Verbal conditioning studies in groups composed of psychiatric patients.

Many of the following studies that are reviewed are based on an operant conditioning technique which has used an experimental design generally referred to as an "ABA" experimental design. Essentially this design is an intra-subject design which allows comparisons of a subject (sometimes a group) in an operant baseline phase (A), a treatment phase (B), and a return to baseline or extinction phase (A).

A brief description will be given for most of the studies, with emphasis on the procedures used and the results obtained. Particular emphasis will be placed on the type of research designs that are used, the use of effective reinforcement procedures, the variety of verbal response classes, and the problems inherent in outcome evaluation of the independent treatment variables.

Verbal conditioning in laboratory and experimental settings

Many of the studies during the application stage of verbal conditioning research have been directed at demonstrating the use of operant conditioning techniques to reinstate, manipulate, or shape the verbal
behavior of psychiatric residents (usually those classified as either psychotic or schizophrenic). In one of the earliest exploratory studies in this area, Isaacs, et. al. (1960) reinstated verbal behavior in two psychotics who had been mute for 19 and 14 years, respectively. They used a shaping procedure of successive approximations; first they reinforced simple attending behaviors such as eye gaze. From that meager beginning, they progressively shaped facial and mouth movements, vocalizations, and eventually verbal behavior. They used gum and cigarettes as reinforcers. In this study, one begins to see the use of operant conditioning techniques as a treatment procedure for reinstating verbal behavior.

Earlier reference was made in Chapter I of a series of studies by Salzinger and his colleagues of reinforcing the verbal behavior of patients in real and in quasi-therapeutic situations. An example of their studies was an experiment in which they experimentally manipulated continuous speech in schizophrenic patients (Salzinger, Portnoy, and Feldman, 1964). Their subjects initially included 88 female and male state mental hospital patients ranging in age from 18 years to 45 years, with a median age of 31.5 years. Their subjects were divided into three groups; each of the subjects were exposed to a procedure in which they were instructed to talk about themselves, their families, their situation, and so forth. Sessions were 30 minutes in length. The subjects in Group A were reinforced (via a light feedback) whenever they emitted a self-referred affect statement (e.g. "I was happy," "We were angry"). The experimenter reinforced (by flashing the light) the patients in Group S for speech in general on a 30-second fixed interval schedule. For Group C the experimenter did not reinforce the subjects at all during the thirty minutes.
A procedure of prods was used to encourage the patients to talk; if the patient did not respond to a series of these prodding questions, he was excluded from the experiment.

Results indicated that Group A emitted a significantly larger number of self-referred affect statements than Group C; also, Group S emitted a significantly larger number of words than Group C during all three 10-minute periods.

However, one of the most significant findings was that under these experimental procedures, about 40 percent of the subjects in each group talked for 30 minutes without questions; this indicated that the reinforcement procedures employed in this study were useful for obtaining samples of "continuous speech" from schizophrenic patients. This study has implications for the present investigation in terms of: (1) demonstrating the rate of verbal behavior can be increased by the delivery of reinforcement, and (2) that particular response classes of verbal behaviors can be increased in their frequency of occurrence contingent upon particular reinforcement contingencies.

A further extension of operant conditioning techniques has been demonstrated to be effective in controlling the symptomatic and delusional verbal behavior of psychotic patients. Ayllon and Haughton (1964) demonstrated that symptomatic verbal behavior exhibited by three mental patients could be systematically manipulated by controlling the reaction of ward staff to the patient's verbalization. When social reinforcement (i.e. attention) was made contingent upon symptomatic verbal responses, these responses increased in frequency; withholding social reinforcement (i.e. extinction) resulted in a decrease in the frequency of symptomatic verbal responses.
In a more recent and sophisticated study, Wincze and Leitenberg (1972) investigated the effects of feedback and token reinforcement on the modification of delusional verbal behavior in chronic psychotics. Their subjects included 10 patients classified as paranoid schizophrenic; mean age of the subjects was 44.9 years, with a mean period of hospitalization of 12.2 years. Each subject was exposed to a baseline phase, a feedback phase, an extinction phase, and a token reinforcement phase. Feedback consisted of the experimenter responding to the patient that his verbal behavior was delusional (i.e. "crazy talk"). Tokens were dispensed contingent upon rational, non-delusional talk. Their results indicated that the effect of feedback was effective for about one-half of the time in reducing the percentage of delusional talk, and in three cases the feedback procedure produced adverse reactions. The use of token reinforcement produced more consistent results and reduced the percentage of delusional verbal behaviors in 7 out of the 9 patients exposed to the procedure.

In conclusion, the effects of both the feedback and the token reinforcement procedures were quite specific to the environment in which they were applied and showed little generalization to other situations.

Another application of the operant conditioning paradigm was used to compare the effects of social and monetary reinforcement on the emission of the pronoun "I" by sociopaths and normal subjects (Bernard and Eiseman, 1967). The sociopathic group was comprised of female prison inmates; the normal subjects were chosen from a larger group of student nurses. Social reinforcement (i.e. attention, the word "good") and monetary reinforcement (i.e. nickels) were made contingent on the emission of the pronoun "I." The results indicated that social
reinforcement was more effective than the monetary reinforcement for both groups, and noticeably so for the sociopaths.

A couple of studies have been done using a "yoked-control technique" to compare the effects of tokens delivered contingently and non-contingently on the desired target verbal behavior (Harmatz and Lapuc, 1968; Lapuc and Harmatz, 1970). The yoked control assures that a control subject receives exactly the same number of reinforcements, dispensed at approximately similar intervals between reinforcement, as does the experimental subject. This allows for a more accurate comparison of the two subjects in terms of the effects of contingent reinforcement. In their two experiments, they dispensed social reinforcements following positive self-reference statements. Both experimental and control groups approximated the same rate of speech; however, the difference occurred in the reinforced class of responses (i.e. positive self-references) for the experimental group and in non-self-references for the control group. It would appear that this yoked-control procedure provides a realistic "control" group for the operant conditioning paradigm.

Lapuc and Harmatz (1970) evaluated therapeutic change between a group of psychiatric subjects given social reinforcement for positive self-references with a yoked-control group of psychiatric subjects receiving the same type of reinforcement non-contingently. Therapeutic change and generalization effects were evaluated by semantic differential concepts, the Taylor Manifest Anxiety Scale, and ward behavior ratings. These measures were administered before, during and immediately after, and 48 hours after the conditioning. Results demonstrated conditioning and generalization to some of the personality measures; however, there was rapid extinction of the generalization effects.
Several studies have demonstrated significant effects of conditioning verbal behavior with normal subjects. Kinzie and Sipprelle (1967) demonstrated that subjects conditioned with a group to emit self-reference statements would emit significantly more self-references in another individual situation. They used a technique of questioning to elicit the self-reference statements and then after these types of responses were emitted the subjects were socially reinforced for them.

The verbal conditioning paradigm has been further explored in quasi-counseling situations with normal subjects. In a simulated counseling situation, Ince (1968) used a fixed-interval reinforcement schedule to modify the rate of emission of positive self-reference statements in three female college students. Reinforcement consisted of the experimenter paraphrasing the subjects' responses whenever the time interval between the subjects' statements permitted. His results indicated that this type of procedure exerted a significant reinforcing effect on the target response class.

A reinforcement procedure consisting of red and green light feedback was used to shape and operant condition confrontive verbal behaviors in the interview patterns of counselors (Hellervick, 1969). Confrontive verbal behavior was defined by the Hill Interaction Matrix (Hill, 1965). Three counselors were reinforced (via light feedback) for confrontive verbal behaviors, and three counselors were reinforced for conventional verbal behaviors. Hellervick's results tentatively suggested that conditioning did occur among the counselors given the feedback for the confrontive behavior; however, conditioning did not occur among the counselors given feedback for conventional verbal behaviors, although their confrontive verbal behaviors were suppressed.
In another quasi-counseling setting, Hoffnung (1969) examined the differential effects of five forms of therapeutic intervention; these were: Um-hmm, echoic responses, paraphrase responses, combined Um-hmm and echoic, and combined Um-hmm and paraphrase. He investigated the effects of these responses on conditioning of affective self-reference statements; as well as investigating any transfer affects that might occur because of conditioning. Significant conditioning effects were obtained; that is, these responses had an effect of reinforcing the emission of the target verbal response. Also, there was a significant generalization effect of increasing the number of affective self-reference statements to a TAT story telling task. However, he found no appreciable effect that differentiated between the potency of the five forms of therapeutic responses.

These studies consistently demonstrate that verbal conditioning does occur with a variety of target response classes. Also conditioning occurs with a wide variety of conditioning techniques (i.e. reinforcers); these include social reinforcement, secondary reinforcement (i.e. tokens), and feedback procedures. The thrust of these studies suggests that conditioning procedures appear to be a viable treatment technique not only with psychiatric patients, but also within the parameters of a therapy-like setting.

Verbal conditioning in group settings of normal subjects

In a series of studies by Oakes (1960, 1961, 1962a, 1962b), the use of a flash of light was demonstrated to be an effective technique to condition target verbal response classes. Oakes' studies were one of the first serious attempts to explore the efficacy of using verbal
operant conditioning techniques in a group setting. The experimental groups were comprised of four subjects (college students) discussing a psychiatric case history. Each subject was reinforced by the flash of a signal light (not visible to the other group members) when he emitted the desired response. Some subjects were told that the light signal indicated that their statements "exhibited psychological insight" as supposedly judged by a team of professional psychologists; other subjects were told that their lights "exhibited a lack of psychological insight." Several variations were tested out, varying the type of comments conditioned and the prestigiousness attributed to the lights (i.e. very qualified judging psychologists as compared with less qualified student opinion). The results demonstrated that in all cases a form of verbal conditioning occurred within the groups.

Oakes carried his studies to the point of systematically examining those type of response classes which are unique to the group setting such as verbal interactions between two or more people. Oakes (1962a) attempted to investigate the conditionability of Bales' 12 categories which were constructed to include all types of verbal behavior that could occur in face-to-face group interaction. Responses falling into each of the 12 categories were systematically reinforced in the group discussion situations in an attempt to determine whether these categories functioned as response classes in verbal conditioning. The light was used again as the reinforcer signifying psychologically insightful responses. Statistically significant results, signifying conditionability, were obtained for only one of the twelve Bales categories: i.e. "gives opinions, evaluations, analyses, expresses feelings and wishes."
One of the major criticisms of Oakes' studies is his use of the light feedback procedure. The question arises as to the potency of a light signal to function as an effective reinforcer. This raises the question of how can one best reinforce verbal behavior in counseling groups? Also, with only one of the twelve defined response classes of Bales having been conditioned, the question arises as to what verbal response classes are amenable to being manipulated in group settings.

Another example of using a light feedback technique was used by Aiken (1965) in which he examined how group members would describe each other accompanying the operant conditioning of the verbal frequency in groups. Four-person groups carried on two successive forty-minute discussions; during the second discussion the subjects with the lowest verbal output from the first discussion were rewarded, and the other three subjects were punished (via a light signal feedback) for speech. After both discussions, subjects ranked one another on several aspects of their interpersonal behavior. The results indicated that: (1) reward increased verbal output significantly over that of the control group, while punishment did not significantly decrease it; (2) after the second discussion, both self-rankings and the ranking of the other group members of the rewarded subjects were significantly higher than corresponding judgments in the control group on leadership, participation, and self-confidence, while quality of ideas was judged as significantly increased by others only.

An ABA design was used to compare the effects of social reinforcement upon the sequence of speakers in presumably normal college students and in patients undergoing group psychotherapy by Eiseman (1965). A significant increase in speech sequence occurred, and when extinction trials were run with the two groups, the sequence returned to baseline.
Kramer (1969) tested the hypothesis that subjects in small group settings systematically verbally reinforced for emitting selected responses would emit a significantly higher proportion of these selected responses to total responses than subjects not so treated. His subjects included six groups of ten freshman subjects in each group. The groups met weekly with a male counselor for six weeks. Three experimental groups were reinforced for three styles of responses: questioning responses, responses indicating a subject was taking responsibility for his behavior, and a positive self-reference statement. The three control groups received non-directive group counseling. An analysis of the tape recording of the sixth session of the groups indicated that the experimental groups had a significantly higher proportion of the selected verbal response classes to total response than did the control group. However, no significant differences existed between the control and experimental groups in other measures of the subjects' behavior: for example, ratings of behavior in the sessions, attendance, or desire to continue sessions.

One of the significant implications of Kramer's (1968) study is the dependent variable of verbal response class which he chose to condition. One begins to notice a pattern in these studies that as research progresses, the verbal response classes that are chosen to be conditioned become more sophisticated and are characteristic of verbal behaviors that may occur in psychotherapy and counseling. Another study by Whalen (1969) further demonstrates a method in which a relatively high level verbal response class (i.e., interpersonal openness) was facilitated in a group of four male college students. Whalen found that subjects exposed to both a film model and detailed prior instruction
tended to engage in more "interpersonal openness;" while groups in the other control conditions failed to do so, devoting most of their time to impersonal discussion. These findings support another method in which a relatively sophisticated verbal response class was modified in a group therapy-like setting.

In an effort to condition a therapeutic style of interaction among a counseling group of college students, Roffers (1969) used a light feedback technique as a reinforcement procedure. He chose Quadrant IV of the Hill Interaction Matrix (Hill, 1965) as his target verbal response class; this is characterized as interaction hypothesized by Hill (1971) as being therapeutically helpful: i.e., open, confrontive and therapeutically work-oriented verbal interaction among group members. Roffer used an ABA experimental design to compare the effects of systematic feedback (via a light signal) contingent on the target verbal response class. There were 28 subjects assigned to 2 experimental and 2 control groups. An initial two base rate sessions were used to record the subject's operant verbal behavior; after this, all four groups received written and tape-recorded materials describing and illustrating the style of interaction hypothesized as being the most beneficial. The experimental groups received systematic feedback via a light signal for the next five treatment sessions whenever they emitted Quadrant IV verbalizations; the light signals were not given during the last two extinction sessions.

Roffer's results indicated that this style of group interaction could be brought under reinforcing stimulus control; however, the frequency of Quadrant IV interaction decreased significantly in the extinction sessions when the feedback was terminated in the experimental groups.
Roffer used the two control groups to assess what effects this style of interaction that was conditioned in the experimental groups had on various outcome measures. Pre- and post-test outcome data included: (1) scores on the HIM-B, an unpublished instrument based on the HIM measuring attitudes toward group interaction, and (2) trained judges' evaluations of group members' behavior changes as indicated on a self-report follow-up questionnaire. There were no significant effects on either of these two measures that could have been attributed to the experimental group functioning at a higher frequency rate of HIM Quadrant IV interactions.

In conclusion, Roffer's (1969) study, as well as others (Kramer, 1968; Oakes 1962a) have demonstrated that fairly sophisticated verbal response classes that are typical of group interaction can be conditioned in group settings of normal subjects. However, none of these studies have been able to demonstrate any appreciable generalization effects nor any effects upon related outcome measures. Perhaps there are several reasons for this: (1) the lack of validity or sensitivity of the outcome measures; or (2) the influence of so many other uncontrolled variables that it becomes difficult to demonstrate a relationship between the treatment and an outside outcome measure.

Even though there are no demonstrated generalization effects upon selected outcome measures, it remains significant that these studies have demonstrated the possibility of conditioning a low probability verbal response and maintaining that verbal response at relatively high frequency levels with a variety of operant conditioning techniques.
Verbal conditioning in group settings of psychiatric subjects

Before examining the research in this section, it becomes important to point out the potential significance of many of these studies goes beyond merely the demonstration of the effectiveness of operant conditioning techniques, but rather it is significant that these studies are beginning to have an impact on the modes of treatment of psychiatric patients. Many of the key symptoms of this population of subjects involve the lack of verbal behaviors, the low level of social responsiveness, and the general poor prognosis toward most traditional treatment modalities. Therefore, it becomes significant when techniques can be demonstrated to be successful when applied to a seemingly "untreatable" population. A general focus of most of the following studies includes: (1) an attempt to demonstrate and apply operant conditioning techniques to a variety of types of psychiatric patients; (2) and an effort to push the limits as to what behaviors (verbal and otherwise) can be brought under reinforcement control.

In one of the earliest studies in this area, Dinoff, Horner, Kurpiewski, and Timmons (1960) hypothesized that group psychotherapy could be conceived of as a more complex form of verbal conditioning. In their study they attempted to demonstrate: (1) the use of verbal conditioning and the permanence of its effect in a group therapy-like situation using eliciting and reinforcing techniques; (2) that their techniques were applicable to a schizophrenic population; and, (3) the use of an easily scorable and reliable index of verbal behavior.

Their study included 10 male chronic schizophrenic patients, in which the median age was 39.5 years. The subjects were divided into two
matched groups. Using an ABA design allowed for three days of fifty-minute sessions each to establish a baseline rate on "personal" and "group" reference statements. Group I subjects were reinforced (via attention and social reinforcement) for "personal reference" statements; Group II subjects were reinforced for "group referenced" statements. Results indicated that there was a general trend emerging in keeping with how the groups were reinforced; however, there were no statistically significant effects. Of greatest import was their method of measuring the initial verbal behaviors, as well as assessing the resulting dependent variable.

In a subsequent study, Dinoff, Horner, Kurpiewski, Rickard, and Timmons (1960) used a similar procedure as above, however, they tested for any generalization effects of these personal group reference responses into a slightly different group setting, i.e. a larger group with no leader. Even though there were significant gains obtained in both categories during conditioning, the effect failed to exhibit significant generalization results in the other situation. Dinoff and his colleagues speculated that with a more normal outpatient population, generalization might have occurred with a similar response class.

In a single subject design, Rickard, Digman, and Horner (1960) demonstrated verbal conditioning with a sixty-year-old male patient, who had been hospitalized for over twenty years. The target verbal response chosen was "rational verbalizations," while an effort was made not to reinforce the incompatible response, i.e. delusional material. They demonstrated significant results among three different examiners in conditioning rational speech, via attention, to a high level of
occurrence under a high frequency of social reinforcement; however, the conditioned response dropped sharply when an attempt was made to lower the frequency of reinforcement.

All of the above studies in this section so far have demonstrated that a schizophrenic inpatient population can be conditioned following an operant conditioning paradigm; however, extinction occurs rapidly when the reinforcement is ceased.

Ullmann, Krasner, and Collins (1961) used a verbal conditioning situation to investigate whether interpersonal interactions can lead to change in a desirable manner in a second, non-experimental situation. They involved 30 male VA psychiatric patients who were participating in 3 separate group therapies. Each of the subjects participated in four storytelling sessions during which emotional words were reinforced in one of the following three ways: (1) a positive personal manner; (2) an impersonal-unstructured manner, i.e. a sound click; and (3) not reinforced at all. Ratings made by group therapists before and after the experimental storytelling sessions indicated a significant gain in the adequacy of interpersonal relationships in the group therapy for the group receiving "positive-personal reinforcement." There was no significant gain for the other two groups on this criterion measure, i.e. interpersonal interaction.

In another psychotherapy group of hospitalized VA neuropsychiatric patients, Salzberg (1962) varied the verbal responses of the therapist in the group in four ways: silences, talking, directing, non-directing. Results indicated that silences by the therapist led to significantly more interaction among group members than did talking by the therapist; and although redirection responses by the therapist did not yield
significantly more interaction, it did lead to significantly more group-oriented responses than talking directly to the patients. Salzberg's study is a further demonstration of the subtle, but significant effects a therapist's verbal behavior has upon the interaction in a group psychotherapeutic setting.

Other studies have also demonstrated varied results in the use of conditioning procedures upon the verbal behavior of psychiatric subjects in group psychotherapy. Hannon and Battle (1962) demonstrated the effectiveness of the use of the experimenter's gaze direction and the latency of the experimenter's response to condition and manipulate the direction of speech, i.e., interaction between subjects. Heckel, Wiggins, and Salzberg (1962) demonstrated the effectiveness of using an unpleasant audiometer stimulus (a tone above 512 cps) presented after each 10-second period of silence to eliminate the frequency and duration of silences in a group therapy setting. This was done without the awareness of the subjects. An ABA design was used which exhibited an initially high frequency and duration of silences during baseline sessions, almost no silences in the treatment sessions, and an increase of silence, measured in terms of duration and frequency, during the extinction sessions; however, the frequency and duration of silence did not reach the former operant level.

Using a similar population and an aversive conditioning tone, Wiggins and Salzberg (1966) more than doubled the number of treatment sessions in an attempt to get more clear-cut conditioning effects than in the previous investigation. Both silences and responses directed to the therapist were reduced during the punishment procedure, i.e., the unpleasant tone, in the two experimental groups. There were no
significant changes in the control group which did not receive the aversive tone. Therapist-directed responses recovered, but silences remained at a low level during the extinction phases, especially for the experimental groups receiving the greatest number of conditioning sessions. This finding suggests the possibility of permanently eliminating certain responses if conditioning is carried out long enough and more adaptive responses have an opportunity to emerge and become established.

Mainord, Burk, and Collins (1965) attempted to compare the results of varied approaches of group therapy in three matched groups, twelve subjects in each group, of chronic, hospitalized, schizophrenic patients. They exposed the three groups to the following approaches: (1) therapist "diverting," directing comments away from personal to impersonal type statements; (2) therapist "confronting," which was the polar opposite of the diverting approach, and was an effort to be direct maximally affective, immediate and concrete; and, (3) no group therapy.

Their results indicated the confronting approach was clearly superior as measured by a "positive incident criterion." This criterion measured such patient behaviors as increased outside visits, seeking employment, self-initiated activities, and so forth; the criterion was measured external to the therapeutic situation as a tabulation of behaviors demonstrating patient progress towards discharge.

The Mainord, et. al. study is fraught with many methodological problems, including the lack of specificity as to how the behaviors of the subjects in group therapy were conditioned in the two ways. In spite of the problems inherent in the reliability and validity of the
outcome criterion measure, it still is significant that a confrontive style of group interaction was shown to have a therapeutic beneficial effect.

Wagner (1966) reported in his study a significant effect in increasing verbal productivity among a group of hospitalized psychiatric subjects. He attempted conditioning procedures within an actual, ongoing therapy group; in that group half of the subjects were reinforced and half were not for verbal initiations. (The verbal initiations were reinforced with positive social reinforcement, i.e. "good," attention, and so forth.) The results indicated that reinforcement was effective in increasing the number of verbal initiations; however, after the sixth session the effectiveness of the reinforcement decreased. There did appear to be a vicarious modeling effect in that the "non-reinforced" subjects began to talk more. This is an example of conditioning procedures used as a treatment technique as a part of ongoing therapy.

In a continued effort to demonstrate the efficacy of operant conditioning techniques with other response classes, Williams and Blanton (1968) investigated three equal treatment groups of six patients each. Two experimental groups received conditioning by verbal reinforcement: one of the groups was conditioned for emitting statements expressing feelings, the other group for statements without discriminable feeling content. The third group functioned as a control and received a traditional type of group psychotherapy. After an initial operant baseline session, treatment was administered for nine one-half hour sessions; the same therapist was used for all the sessions. Tape recordings of the sessions were scored for the frequency of statements made that expressed
feelings for all of the groups. The percentage of feeling statements increased for the group receiving reinforcement for that category, and for the group receiving ordinary psychotherapy. The group in which reinforcement was given for statements "without feelings," the percentage of feeling statements decreased slightly, but the percentage of non-feeling statements did not increase. Subjects did not express awareness of the reinforcement contingency. This study is another in which a particular style of verbal interaction was demonstrated to be conditioned by verbal reinforcement.

Use of token reinforcement in group therapy. It has been found that animals and humans will work for secondary reinforcers in the form of tokens, provided these tokens can be exchanged later for primary reinforcers. Token reinforcement economies have been established in many mental hospitals and institutions to manipulate and control the behavior of psychotics and mentally defective patients in efforts to increase their range of adaptive behaviors. Ayllon and Azrin (1965, 1968) described a treatment program in which schizophrenic patients worked for tokens which could be exchanged for primary, or at least more significant, reinforcers. Examples of what tokens could be exchanged for included: privacy, leave from the ward, social interaction with staff members, recreational opportunities, shopping items such as food, cigarettes, candy and so forth. Usually tokens can be earned for carefully defined types of behaviors (work and adaptive behaviors) and in turn each type of reinforcer costs a specified number of tokens. Recently, the token reinforcement technique has been expanded in the use of conditioning well-defined verbal response classes.

Alumbaugh (1971) compared the verbal responses made to the therapist and verbal responses made between patients in a group situation.
Twelve female chronic hospitalized patients, averaging in age at 52.1 years, were divided into three experimental groups and one control group. A total of 20 sessions were given to the groups; the initial 10 sessions were used to establish a baseline on the target verbal response. The target verbal response was labeled as "social responses;" it was defined as a verbal response directed from one patient to another with eye contact. Tokens were dispensed immediately to the patient for each "social response" with no further explanation given. The three experimental groups were established to determine the efficacy of each of three therapists (psychiatric aides) in manipulating the interactions (i.e. social responses) among a group of three patients. An additional group of three patients was established in which no tokens were given in either the first ten sessions or the last ten sessions. Each of the sessions lasted 30 minutes. During the first phase of each group session the experimenter investigated the effects of direct inquiry (e.g. "What did you do today?" and so forth) under conditions of nonreinforcement. Following this, there was approximately a five-minute pause before the second phase was begun in which the patients were instructed: "You are now expected to talk to each other; I will not say anything for five minutes." After the initial 10 baseline sessions, the therapists in each of the experimental groups were instructed to use a fixed-ratio schedule of 1 token reinforcement for each social response made by the patient.

The results indicated that the mean number of social responses made between chronic patients without direct verbal intervention of a therapist was significantly increased with the token reinforcement. Also, verbal responses, even though not reinforced, directed to a
therapist were found to be greater over baseline and treatment phases of the study. The significantly greater number of responses to direct inquiry suggested that the staff, as well as the tokens were associated with cues of reinforcement.

Hauserman, Zwebach, and Plotkin (1972) demonstrated very significant results using token reinforcement to condition verbal initiations in a group therapy setting of six hospitalized adolescents. The adolescents ranged in age between 15 and 17 years and had been hospitalized for behavioral problems. The experiment was conducted over 15 semi-weekly sessions; each session was 30 minutes in duration. The group had been in prior existence for five months; the co-therapists were a clinical psychologist and a psychiatric nurse. The group consisted of three paired members, matched according to their relative frequency of initiatory behavior; one of each of the pairs was assigned either to experimental group A or B. All the subjects participated in the one group together, but members received differential reinforcement according to their assignment to the subgroupings.

The basic data and target verbal response to be conditioned was "verbal initiations;" these were defined as spontaneous emissions of verbal behavior to a group member or to one of the co-therapists. Two judges observed and recorded the data; they achieved an inter-rater reliability of 95 percent.

There were a total of 15 sessions. The initial 4 sessions were used to collect baseline data on all of the subjects. During sessions 5 to 8, Group A subjects received tokens contingent upon the emission of a "verbal initiation." During sessions 9 to 13, Group B subjects received the tokens while the 3 subjects in Group A were put on
extinction. During sessions 14 and 15, all 6 subjects received tokens. Tokens were distributed on a variable ratio 3 schedule.

Results were presented in the form of graphs; they clearly supported the hypothesis that adolescents who are typically non-verbal and considered to be poor candidates for verbal types of psychotherapy, can be shaped into emitting a substantially higher rate of verbal initiations. Reversal procedures demonstrated the expected extinction effects. During experimental phase I (sessions five to eight) while Group A received token reinforcement, there was a consistent and moderate increase in verbal initiations among the subjects in Group B; this was discussed in terms of a vicarious modeling effect.

Although this particular experiment only attempted to manipulate the quantity of responses and not the quality, the authors contended that due to group peer pressure, the amount of silly, off-topic verbalizations decreased and there was an increase of relevant and mature verbalizations as the number of verbal initiations increased. One of the authors' final suggestions was that token reinforcers might be able to feasibly be used to shape distinctive classes of quality verbalizations.

In summary, these two last studies have illustrated ways in which token reinforcement procedures can be used as a treatment procedure in two different types of group therapy. One major advantage of token reinforcement is the degree of specificity and concreteness achieved in using tokens; perhaps the use of concrete tokens enhances the already significant effects that have been demonstrated to be inherent in the social reinforcement techniques used in previous verbal operant conditioning studies.
Summary

In the present chapter, operant conditioning studies that have attempted to modify verbal behavior in laboratory settings, and in group settings of normal and psychiatric subjects have been reviewed. From the wide variety of studies presented, there appears to be a trend in which the conditioning procedures have begun to be viewed more as a treatment procedure than just as an experimental independent variable. Also, these studies have progressively conditioned target verbal response classes beyond the simple one-word response classes of the earliest investigations to more sophisticated types of verbal responses that are typical of an interpersonal type of therapy. In designing a research project in this area, several considerations have been made on the basis of earlier studies in terms of: the target verbal response class to be conditioned; the reinforcement procedure to be used; the availability of any outcome measures; and last of all, research design considerations.

Target verbal response class considerations. Earlier studies attempted to operant condition such simple verbal responses as: pronouns, plural words, verbs, nouns, and so forth. However, if the use of operant conditioning procedures is to be viewed as a treatment technique in group counseling and psychotherapy, it becomes necessary to determine the kinds of response classes that are both conditionable as well as appropriate and relevant to therapeutic function in a chosen population. The studies reviewed in this chapter have demonstrated the conditionability of the following response classes: self-reference affect statements; the verbalization rate of group members; the giving of opinions; the direction of speech; verbal initiations; the frequency
of group member-to-member interaction; therapist-directed responses; silences; interpersonal openness; "confrontive" statements, and so forth.

The previous studies suggest that the response classes which are typical of group therapy, that is, interpersonal openness, confrontive statements, and so forth, have for the most part been demonstrated to be conditionable with "normal" subjects. The extent of previous studies in conditioning the response classes with psychiatric subjects, and particularly schizophrenic patients, has been to get them to initiate and continue to verbalize, or to condition less complex social response classes. One of the questions that arises is whether therapeutic responses can be conditioned in chronic psychiatric patients.

Several studies (Roffer, 1969; Hellervick, 1969) have demonstrated success in conditioning a style of therapeutic interaction, as defined by Quadrant IV of the Hill Interaction Matrix, with normal subjects. At this time there have been no reported research studies that have demonstrated that this style of therapeutic interaction can be conditioned into the restricted verbal repertoire of schizophrenic patients.

Reinforcement procedure considerations. One of the best ways to determine whether a stimulus is a reinforcer is to test its effect on some operant response which preceded it. A positive reinforcer then is any stimulus event that leads to an increased probability of increasing an operant response. In most of the previous studies, a certain stimulus has been defined as a positive reinforcer prior to testing whether, in fact it functions as one.

The type of stimulus events that have been used to reinforce verbal responses include: light signals, tones, words such as good, umm-hmm,
paraphrasing, attention, money, and tokens. In all cases the reinforcer used was one that was assumed to have acquired a reinforcing value. Therefore, the effectiveness of a particular reinforcer being used is a major factor of concern in a verbal operant conditioning study.

Recent studies (Alumbaugh, 1971; Wincze, et. al., 1972; and Hauserman, et. al., 1972) have demonstrated the effectiveness of tokens as reinforcers in verbal conditioning studies. One of the advantages of using tokens is the inherent bonus of back-up stimuli such as food, privileges, etc., that can function as reinforcers. In the studies where tokens have been used, the subjects generally have had previous experience with the tokens; this hopefully increases the probability that the tokens will function as reinforcers. And lastly, with especially regressed subjects such as chronic psychiatric patients, there tends to be an additional benefit of using concrete reinforcement. Previous research (Ayllon and Azrin, 1965, 1968) have demonstrated that chronic patients tend to be amenable to change when using concrete tokens to reinforce certain target behaviors. In order to insure maximum benefits, tokens appear to be a reinforcer of choice, especially with more regressed or chronic types of patients.

**Outcome measure and generalization evaluation.** Whereas most of the reviewed studies reported significant conditioning effects, few provide any clear-cut results to demonstrate generalization effects of the conditioned verbal responses to another situation, nor any indication of a significant effect on available outcome measures. At best there appears to be trends that suggest a certain group of subjects tend to emit a higher frequency of the target conditioned response in
another situation, or there are merely trends suggesting that the conditioning treatment has effected a change on an independent pre- and post-outcome measure: such as attitude toward group functioning, behavior problem check lists, personality inventories and so forth.

One of the few studies that did report a positive effect upon an outcome measure was done by Mainord, et. al., (1965). He demonstrated that after chronic schizophrenic patients had been involved in a confronting style of group therapy, there was a significant change on a "positive incident criterion," i.e., a measure of ward behaviors. This suggests that perhaps looking at the ward behaviors of a patient is a good place to begin in examining for possible generalization effects.

Otherwise, the state of research at this time does not lend itself to making reliable predictions as to how conditioning a certain style of therapeutic interaction is going to change that subject outside of the conditioning situation. However, this does not mean researchers shouldn't make hypotheses about these types of changes; but it does mean they need to be aware that in making these types of hypotheses, they are of an exploratory nature rather than hypotheses which are more definitive and highly predicable.

**Research design considerations.** The predominant research design used in the studies reviewed has been a single subject design that allows for a subject, or a group, to provide its own control in several experimental phases. This has been referred to as an ABA design. This type of design allows for an intra-subject assessment of reinforcement control on a given target response as compared in baseline and extinction phases.

The yoked-control technique was used in a couple of studies and was shown to be an effective procedure for providing an additional control
of the specific reinforcing effect of a stimulus contingent upon the response to be modified. This provides a control on whether the reinforcement procedure is having an actual effect in modifying a verbal response during the phases of contingent reinforcement as compared to a phase of non-contingent reinforcement.

In a few studies, several groups were used in order to allow comparisons upon selected pre- and post-tests. The use of additional control and experimental groups allows for flexibility in testing the effects of conditioning under varied circumstances as well as upon selected outcome measures.

In conclusion, the operant conditioning research paradigm allows for an effective tool in examining the reinforcing control upon verbal behavior. However, the use of a semblance of a group design allows for additional statistical controls, additional comparisons on outcome measures, and additional inter-group controls on the effects of operant conditioning as opposed to a group not receiving conditioning.
CHAPTER III

METHODOLOGY

The primary objective of this study was to compare the effects of contingent and non-contingent token reinforcement upon the target behavior of therapeutic verbal responses. A single subject experimental design (ABA sequence) allowed comparisons of both the frequency and duration of therapeutic responses in baseline and treatment conditions for the subjects.

A secondary objective of the study was to compare groups which received token reinforcement with a control group which received no token reinforcement on several outcome measures. These outcome measures included pre- and post-testing on the MACC Behavioral Adjustment Scale, and the HIM-B. Also, comparisons were made between the groups on the frequency and duration of therapeutic responses.

Definition of behaviors observed

Therapeutic responses are talk responses that are based on the parameters of Quadrant IV of the Hill Interaction Matrix (Hill, 1965). These responses are problem-solving interactions concerned with behavioral change.

The HIM was developed by William F. Hill and Ida S. Hill at the Utah State Hospital to rate the verbal interaction of therapy groups. It consists of four content/style categories and five work/style categories in which observers may classify the verbal interaction of therapy groups.
Figure 1 illustrates the matrix with the appropriate row and column labels and headings. On the top of the matrix the content/style categories are divided into two sections: topic centered and member centered. These categories are subdivided into the following four columns: Column I (topic) is the category for discussions about general interest topics. Column II (group) indicates discussion about the group itself and/or its process. Column III (personal) focuses on group interaction which deals historically with a particular member's problem. Column IV (relationship) categorizes interaction dealing with the interactions of group members to each other (such as teasing, arguing, giving honest feedback, and so forth). The verbal content of this fourth category emphasizes here-and-now interaction among group members rather than historical expressions centering around just one person, as in the third category.

On the left side of the matrix in Figure 1 are the work/style categories which are meant to describe the way in which the group is interacting, not what they are interacting about. Basically, the work/style side of the matrix is divided between interactions that are predominately problem-oriented with a therapeutic intent and those interactions that do not have a therapeutic intent.

The "Responsive A" categories are those usually given only in groups composed of regressed patients such as one finds in State Mental Hospitals. The style of interaction is one in which a therapist must probe and encourage patients to respond to questions and instructions in a socially appropriate manner.

The "Conventional B" categories are those interactions characterized by conversational-type groups typical of parties and discussion
<table>
<thead>
<tr>
<th>Pre-Work Style</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IA</td>
<td>IB</td>
<td>IC</td>
<td>ID</td>
<td>IE</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>II</td>
<td>II</td>
<td>II</td>
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<td></td>
<td>IV</td>
<td>IV</td>
<td>IV</td>
<td>IV</td>
<td>IV</td>
</tr>
</tbody>
</table>

**Figure 1. Hill Interaction Matrix**
groups, where the intent is to socialize and not to discuss problems at all.

The "Assertive C" categories are characterized by interactions in which members are speaking emotionally about their problems in order to gain attention, assert their independence, or challenge the group. The intent is to "speak out" about their problem without any intention of listening to whatever help the group has to offer.

The "Speculative D" and the "Confrontive E" rows differentiate the work-oriented categories. The speculative categories are characterized by discussion that takes place in an intellectual, controlled and non-emotional manner among group members. The confrontive categories are characterized by verbalizations that are more emotionally laden, direct and confrontive in member-to-member feedback in real here-and-now, rather than hypothetical there-and-then problems.

The developers of the HIM constructed a "therapeutic value system" within the matrix by assigning a weighted score to 16 of the 20 cells. Increasingly higher weighted scores are given to those cells categorizing verbal interactions that exhibit more open and frank exchange of feelings and ideas, risk-taking regarding self-exposure, and constructive problem solving roles among the group members.

In this study Therapeutic Responses were defined as those HIM cells given the four highest therapeutic ratings: (1) personal speculative; (2) relationship speculative; (3) personal confrontive; and (4) relationship confrontive.

Talk Responses were recorded: (1) when a subject emitted at least three continuous words; (2) no matter how long or how many words the subject spoke.
Hypotheses

Using the above definitions, the following hypotheses were tested as follows:

(1) Therapeutic Responses will occur more frequently and for longer durations in subjects:
   
   (1a) when they are under conditions of contingent token reinforcement than under a condition of non-contingent token reinforcement;
   
   (1b) when they are under conditions of non-contingent token reinforcement than under a condition of no token reinforcement;
   
   (1c) in experimental therapy groups receiving token reinforcement than in a control group receiving no token reinforcement.

(2) The experimental groups receiving token reinforcement will be rated as significantly more changed, in a positive therapeutic direction, than a control group, on the following pre- and post-test measures:

   (2a) MACC Behavioral Adjustment Scale, as rated by ward nurses; a measure of everyday ward behavior;
   
   (2b) HIM-B Inventory: a self-administered instrument designed to measure a person's interaction preferences in group situations.

Subjects

Fifteen chronic, psychiatric patients from the Wyoming State Hospital participated in the study; nine were females, six were males. The mean age of the patients was 37 with a range of 18 to 66 years. The mean duration of continuous hospitalization, figured on their latest admittance to this hospital only, was 522.4 days with a range of 137 to 2106 days. Nine were classified as schizophrenic, and six were
classified with various other psychiatric diagnoses. A summary of the biographical characteristics of the subjects can be found in Appendix A.

The subjects were randomly placed into three groups of equal size: two experimental groups and one control group. Prior to the experiment all subjects signed a form that read:

I voluntarily consent to being a participant in a research project. I understand that no harm will come to me, and that the entire therapy sessions will be conducted by qualified personnel. I have also been informed of the procedures that have been taken to ensure my integrity, welfare, and confidentiality.

The patients' signatures were witnessed by nursing personnel.

This was a standard form requested by the hospital for research projects of this type. Even though the groups were leaderless and not conventional types of therapy groups, the patients were aware they were being observed by psychologists. In essence, the groups verbal behavior was being monitored and led by the psychologists from behind the one-way mirror.

Sources of outcome data

Pre- and post-tests were collected on all subjects; the tests were given during the weeks before and after the actual experiment.

**HIM-B Inventory** (Appendix B) is an unpublished instrument developed by William F. Hill, and based on the HIM; it was designed to measure a person's interaction preferences in group situations. It has 64 items that describe interpersonal situations representing prototypes of interaction in each of the 16 cells of the matrix (excluding the responsive categories). There are four items per cell. The individual items for each cell are weighted from one to four, making it possible for a person to receive a minimum score of zero and a maximum score of ten in each cell. The range of possible scores for the overall matrix is from zero
to 160. A high score indicates that the person sees himself relating in such a way as to explore all areas of group interaction openly and directly.

Anderson (1965) studied the effects of role playing in group counseling and found the HIM-B to be sensitive to changes over time. In another study, Landy (1968) utilized the HIM-B as a pre- and post-test measure and significantly different change scores among two experimental groups and a control group that received different treatment procedures. These data give tentative indications that the HIM-B is an instrument sensitive enough to be used as an outcome criterion measure. Hill (1968) found that the split-half reliability of the HIM-B was .94 with the Spearman-Brown correction.

In this study the HIM-B was used to compare pre- and post-group therapy scores to determine if there was any overall change in the group members' attitudes toward group participation.

The MACC Behavioral Adjustment Scale: an objective approach to the evaluation of behavioral adjustment of psychiatric patients. This scale was developed by Robert B. Ellsworth (1957). This is a quick rating scale that can be used by ward nurses and attendants to measure the typical ward behavior of hospitalized psychiatric patients. It consists of 14 5-point linear scales which yield 4 cluster scores - motility, affect, cooperation, and communication - and a total adjustment score. The total adjustment score is based on the last three cluster measures. Examples of items that contribute to the total adjustment score include the following questions from the scale: "Does he (patient) take part in sensible 'back and forth' conversation, listening as well as talking to you, not just answers to your questions, but a 'give and take' conversation?" "In the things that are expected of him to do, does he go
ahead and do them on his own without having to be told how and when to do it, or must he be directed and encouraged to do them?" "Is he bitter?"

The range of possible scores for the total adjustment score is from 11 to 55; a high score indicates better adjustment.

In developing the MACC scale, Ellsworth preselected items which differentiated between drug-improved and drug-non-improved patients. Ellsworth and Clayton (1959) reported that the interrater reliability of two independent raters was .89 on their total score ratings. They suggested a possible use of the scale was as a measurement of behavior adjustment and improvement in cases of mental illness. Lorr (1959) in his review of the MACC reported that routine use of the scale is questionable in view of the limited normative data presented and the restricted validational information; however, he concluded that the MACC scale appeared to be a promising device for the evaluation of behavior adjustment in a limited number of areas.

The MACC scale was used in two previous studies examining group psychotherapy. Geidt (1961) rated 65 chronic patients in order to assess an index based from the MACC scale as to the subject's suitability for group therapy. His results suggested that those patients rated as less disturbed and disorganized, and showing an average activity, and who were cooperative and communicative would function fairly well in group therapy. Anker and Walsh (1961) used the MACC scale as a pre- and post-test measure to compare 134 male VA psychiatric patients in 2 types of group activities: group psychotherapy and a group activity program resulted in significant and consistent results in the predicted direction on the MACC scale.
In this study the MACC scale was used to compare pre- and post-test total ward adjustment scores in order to determine if subjects receiving token reinforcement for therapeutic responses would be rated as more improved following group participation than subjects in a control group. The ratings of two independent raters (nurse and aide) were averaged to decrease the interrater error.

Data collection of behaviors observed

Research personnel. Data collection was done by four individuals; two rated talk responses, and two rated therapeutic responses. The raters observed the subjects in the groups from behind a one-way mirror. An intercom system allowed the raters to listen to the subjects. These four individuals rating talk and therapeutic responses were located next to the mirror.

Prior to the study all the raters received at least three hours of systematic instruction in using the Hill Interaction Matrix to observe group verbal responses. The individuals who rated the therapeutic responses were: one Ph.D. and one M.A. level psychologists; these individuals had had considerable experience in using the HIM.

Apparatus for data collection. The data were recorded in two Simpson ten-channel event recorders. Each recorder had ten channels, thus giving a total of twenty channels. Five of the channels were designated for each subject's talk responses, another five were designated for therapeutic responses, one for each subject. The Simpson ten-channel recorders recorded when a response occurred, the number of times it occurred, and how long that response was emitted. Thus, for each session, the following data could be extrapolated for each subject as well as for the total group: the total number of talk responses, the
total number of therapeutic responses, the total length of talk
responses, and the total length of therapeutic responses.

Each rater had one switch for each individual in the group. Therefore, there were four sets of switches. The switches from left to right were situated in sets, one for the talk rater, then a set of switches for one therapeutic rater, a divider separating the raters, a set of switches for the second talk rater, and then the final set of switches for the second therapeutic rater. A talk rater activated the switch for the designated subject when that subject emitted a response that was three or more words. This switch remained activated as long as the individual talked. If both talk raters simultaneously activated their switch for the subject talking, a response was then in fact recorded on the Simpson ten-channel recorder. In addition to this, digital counters recorded each time either of the raters switches were activated. Consequently, error responses were computed by subtracting the number of simultaneous activations from the number of times both raters' digital counters were activated. Only one talk response for any subject could be recorded at a time. Therapeutic responses were recorded in the same way utilizing the two therapeutic raters and their two independent sets of switches.

**Interrater reliability.** The guidelines for reliability were adopted from an article by Johnson and Bolstad (1972). Reliability was calculated using the following procedure: correct responses over incorrect responses, plus correct responses. Before the experiment began each individual had to maintain inter-observer agreement for four days, one-half hour each day, at the 90 percent level.
The apparatus used for data collection facilitated in making continuous checks throughout the experiment on interrater reliability. The two sets of switches for talk and two sets of switches for therapeutic talking were wired in series. Thus, for the Simpson ten-channel event recorder to record, both had to be simultaneously activated. In addition to this, each switch, whether talk or therapeutic, was wired independently to a digital counter. Each counter was designated to record the number of times that switch was activated. Therefore, for each subject the following data could be obtained: the total number of times that both raters activated their switch for that subject, and the total number of correct responses (i.e. simultaneous activation) which was taken off the ten-channel event recorder. Error responses were all those times when one rater activated his switch while the other rater did not.

Interrater reliability checks were made during each phase of the experiment. These checks indicated that the interrater reliability was maintained between an 80th to an 85th percent level for all groups in all the phases: baseline, extinction, contingent tokens, and non-contingent tokens.

The treatment procedures

The subjects were randomly placed into three groups; each group had five members and there was no designated leader or therapist. In Group I there were four females and one male, in Group II there were four females and one male, and in Group III (i.e. control group) there were four males and one female. The experimental room was approximately 12 feet by 12 feet; chairs were arranged in a circle. The four raters were located in an adjacent room, and observed through a one-way mirror.
An additional individual stood in the experimental room with the subjects, however, apart from the group of subjects. He observed a light that signaled when the therapeutic raters had simultaneously activated their switches. This individual dispensed a token to the subject talking when the light came on. One token was dispensed for each therapeutic response. This individual achieved and maintained a reliability of at least 95 percent with the raters in dispensing the tokens to the appropriate subject at the correct time for reinforcement.

There was usually no problem identifying which patient should receive the token for in these groups of chronic patients rarely did more than one patient talk at a time.

None of the subjects were given prior instruction as to the purpose of the study; they were told that this was considered to be a group therapy session and they would, at times, be able to earn tokens. The tokens could be exchanged for cigarettes, candy, cosmetics, and so forth any time following the experimental sessions each day.

All the sessions were 30 minutes in duration; there were a total of 22 sessions for both experimental groups, 16 sessions for the control group. The groups met daily, 5 times a week.

The experimental design allowed for single subject comparisons as well as group comparisons.

Single subject design. Two experimental groups were exposed to the following procedures:

(1) A Baseline Phase: an operant level of frequency of therapeutic responses was recorded for seven sessions. The decision for the number of baseline sessions was made after the operant level of these target behaviors stabilized within a 10 percent criterion level.
(2) A Contingent Reinforcement Phase: the subjects were reinforced via tokens for each therapeutic response. This phase lasted five sessions.

(3) A Return to Baseline Phase: no tokens were distributed for five sessions.

(4) A Non-Contingent Reinforcement Phase: This was used to assess the effect of dispensing tokens non-contingent on the target response. A Yoked-Control Technique (Harmatz and Lapuc, 1968) was used to insure that the number of tokens, and the duration between tokens dispensed in this phase approximated that in the contingent reinforcement phase. A tape recorder had been used during the contingent phase, and whenever a token had been dispensed a sound (i.e. click) was put on the tape. Thus, during the non-contingent phase the tape was played again and whenever the click sounded, the light was switched on in the group room to signal time for a token to be dispensed. The token was given to that subject having spoken most recently prior to when the light had been switched on, whether or not that subject had spoken at a therapeutic level.

In Group II the non-contingent phase was prior to the contingent phase; this made it difficult to use a Yoked Control. Thus, the tokens dispensed in the non-contingent phase of Group II were dispensed as closely representing the schedule of reinforcement (both in frequency and duration between reinforcements) as in the contingent phase of Group I. The primary reason for having Group II was to assess any sequence effect that might have occurred on having the non-contingent phase precede or follow the contingent phase.

Group design. The third group functioned as a control in which no tokens were dispensed for any of the sessions. This was to assess the
effects of group participation without any treatment conditions; it also allowed for a comparison of the two experimental groups with a control group on selected outcome measures.

Figure 2 summarizes the experimental phases of the three groups.

<table>
<thead>
<tr>
<th>Sessions:</th>
<th>1-7</th>
<th>8-12</th>
<th>13-17</th>
<th>18-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I:</td>
<td>Baseline</td>
<td>Contingent</td>
<td>Extinction</td>
<td>Non-Contingent</td>
</tr>
<tr>
<td>Group II:</td>
<td>Baseline</td>
<td>Non-Contingent</td>
<td>Extinction</td>
<td>Contingent</td>
</tr>
<tr>
<td>Control Group:</td>
<td>[Baseline]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Summary of the experimental design

Data analysis

In Groups I and II each subject within the groups provided his own control for the effects of contingent token reinforcement on conditioning the verbal behaviors of therapeutic responses. Graphs comparing the three groups and on each subject were used in order to illustrate the effects of each phase upon the target behavior: therapeutic responses.

An analysis of variance model appropriate for an intra-subject and intra-group replication design was used to assess significant changes in the response rate of therapeutic responses in the treatment conditions as compared to the baseline phases. This one-way analysis of variance
model was described by Gentile, Roden, and Klein (1972). The assumptions underlying the use of their model are: (1) the treatment effects being what are traditionally considered the between-subjects effects, and (2) the number of observations being considered the standard within-subjects effects. The Scheffe method was used to compare the means two at a time following a significant F test.

An inter-group analysis of variance design was used to assess significant differences in the mean frequencies of therapeutic responses among the three groups.

Analysis of covariance was used to assess any significant differences among the three groups in both of the outcome measures. The pre-test, in both cases, was used as a point of covariance.
CHAPTER IV

RESULTS

Analysis of the data was based on the following comparisons: (1) the comparison of token reinforcement upon the frequency and duration of therapeutic responses across the phases within Groups I and II and their subjects; (2) the comparison of the effects of token reinforcement upon the frequency and duration of both therapeutic responses and talk responses among the three groups; and (3) the comparison of changes from pre- to post-testing of all three groups on both the MACC and the HIM-B. Raw data for pre- and post-tests are in Appendix C.

Therapeutic responses

Frequency of therapeutic responses. Figure 3 portrays a comparison of the mean frequencies of therapeutic responses for the three groups during each session across the four phases. Each group's performance within the four phases indicates graphic support for the following hypotheses: (1) therapeutic responses were more frequent under conditions of contingent token reinforcement than under conditions of non-contingent token reinforcement and conditions of no tokens; and (2) there were more frequent therapeutic responses in both of the groups receiving token reinforcement than in a control group receiving no token reinforcement.

Appendix D contains graphs for all Group I and II subjects on the frequency of therapeutic responses across the four experimental
Figure 3. A comparison of the mean frequencies of therapeutic responses for the three groups.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Sessions</th>
<th>Group I:</th>
<th>Group II:</th>
<th>Group III:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-7</td>
<td>Baseline</td>
<td>Baseline</td>
<td>No Tokens</td>
</tr>
<tr>
<td>2</td>
<td>8-12</td>
<td>Contingent</td>
<td>Non-Contingent</td>
<td>No Tokens</td>
</tr>
<tr>
<td>3</td>
<td>13-17</td>
<td>Extinction</td>
<td>Extinction</td>
<td>No Tokens</td>
</tr>
<tr>
<td>4</td>
<td>18-22</td>
<td>Non-Contingent</td>
<td>Contingent</td>
<td></td>
</tr>
</tbody>
</table>
phases. These graphs support the hypotheses that all the experimental subjects increased in their frequency of therapeutic responses in the predicted directions.

A one-way intra-group analysis of variance design was used to compare whether these differences among the four experimental phases were greater than would have been expected by chance. An F ratio of 48.26 for Group I and 23.47 for Group II indicated that the difference of the frequency of therapeutic responses among the four phases was significant beyond the .01 level.

Individual intra-subject analyses of variance on the 10 subjects in Groups I and II indicated that the difference between the mean frequency of therapeutic responses among the 4 phases was significant for 8 of the 10 subjects. These F ratios for 7 of the 8 were significant beyond the .01 level, and 1 was significant beyond the .05 level.

Table 1 summarizes these intra-group and intra-subject analyses of variance comparing the mean frequencies of therapeutic responses as observed in the four experimental phases.

Table 2 summarizes the comparisons of the means from each phase, two at a time, for Groups I and II on the frequency of therapeutic responses in each phase. The Scheffe' method was used to test these comparisons. Perusal of this table indicates that eight of the ten subjects emitted significantly more therapeutic responses under the phase of contingent token reinforcement than under the baseline phase. Seven of the ten subjects emitted more therapeutic responses under the phase of contingent token reinforcement than under the phase of non-contingent token reinforcement. All of these mean differences were significant at least beyond the .05 level, and most were significant
Table 1. Summary of intra-group and intra-subject analyses of variance comparing the mean frequencies of therapeutic responses as observed within the four experimental phases

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean (N=7)a</th>
<th>Mean (N=5)</th>
<th>Mean (N=5)</th>
<th>Mean (N=5)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline Phase</td>
<td>Contingent Phase</td>
<td>Extinction Phase</td>
<td>Non-contingent Phase</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>2.14</td>
<td>98.4</td>
<td>21.0</td>
<td>28.8</td>
<td>48.26**</td>
</tr>
<tr>
<td>S: I-1</td>
<td>0.00</td>
<td>12.0</td>
<td>0.0</td>
<td>1.2</td>
<td>8.16**</td>
</tr>
<tr>
<td>S: I-2</td>
<td>0.43</td>
<td>50.6</td>
<td>12.6</td>
<td>19.4</td>
<td>27.14**</td>
</tr>
<tr>
<td>S: I-3</td>
<td>0.00</td>
<td>17.2</td>
<td>4.0</td>
<td>4.2</td>
<td>24.98**</td>
</tr>
<tr>
<td>S: I-4</td>
<td>0.00</td>
<td>3.4</td>
<td>0.6</td>
<td>0.0</td>
<td>4.26*</td>
</tr>
<tr>
<td>S: I-5</td>
<td>1.71</td>
<td>20.8</td>
<td>3.8</td>
<td>4.0</td>
<td>17.31**</td>
</tr>
</tbody>
</table>

| Group II | 15.42       | 28.6       | 8.0         | 73.2       | 23.47** |
| S: II-1  | 0.57        | 4.8        | 1.4         | 12.0       | 24.36** |
| S: II-2  | 10.71       | 8.8        | 2.0         | 29.0       | 9.89**  |
| S: II-3  | 4.85        | 7.0        | 4.2         | 24.4       | 6.12**  |
| S: II-4  | 0.71        | 4.2        | 0.6         | 4.4        | 2.18    |
| S: II-5  | 1.00        | 2.4        | 0.0         | 3.0        | 3.07    |

aRepresents the number of sessions.

**Significant beyond the .01 level.

*Significant beyond the .05 level.
Table 2. Comparisons of the means of the frequency of therapeutic responses in each phase.

<table>
<thead>
<tr>
<th>Subject</th>
<th>$A_1 &amp; B$</th>
<th>$A_1 &amp; A_2$</th>
<th>$A_1 &amp; C$</th>
<th>$B &amp; A_2$</th>
<th>$B &amp; C$</th>
<th>$A_2 &amp; C$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>135.78**</td>
<td>5.21</td>
<td>10.41*</td>
<td>75.25**</td>
<td>60.84**</td>
<td>0.76</td>
</tr>
<tr>
<td>S: I-1</td>
<td>19.45**</td>
<td>0.00</td>
<td>0.19</td>
<td>16.66**</td>
<td>13.50*</td>
<td>0.16</td>
</tr>
<tr>
<td>S: I-2</td>
<td>78.52**</td>
<td>4.62</td>
<td>11.22*</td>
<td>38.60**</td>
<td>26.02**</td>
<td>1.23</td>
</tr>
<tr>
<td>S: I-3</td>
<td>70.77**</td>
<td>3.82</td>
<td>4.22</td>
<td>35.70**</td>
<td>34.63**</td>
<td>0.01</td>
</tr>
<tr>
<td>S: I-4</td>
<td>10.41*</td>
<td>0.32</td>
<td>0.00</td>
<td>6.07</td>
<td>8.96</td>
<td>0.27</td>
</tr>
<tr>
<td>S: I-5</td>
<td>44.38**</td>
<td>0.53</td>
<td>0.63</td>
<td>30.16**</td>
<td>29.46**</td>
<td>0.00</td>
</tr>
<tr>
<td>Group II</td>
<td>51.77**</td>
<td>0.85</td>
<td>2.69</td>
<td>56.50**</td>
<td>26.44**</td>
<td>5.64</td>
</tr>
<tr>
<td>S: II-1</td>
<td>63.72**</td>
<td>0.33</td>
<td>8.72</td>
<td>47.01**</td>
<td>21.69**</td>
<td>4.83</td>
</tr>
<tr>
<td>S: II-2</td>
<td>14.46**</td>
<td>3.28</td>
<td>0.15</td>
<td>27.02**</td>
<td>15.21*</td>
<td>1.71</td>
</tr>
<tr>
<td>S: II-3</td>
<td>14.30*</td>
<td>0.01</td>
<td>0.17</td>
<td>13.09*</td>
<td>9.71*</td>
<td>0.25</td>
</tr>
<tr>
<td>S: II-4</td>
<td>3.60</td>
<td>0.00</td>
<td>3.22</td>
<td>3.27</td>
<td>0.01</td>
<td>2.94</td>
</tr>
<tr>
<td>S: II-5</td>
<td>3.81</td>
<td>0.95</td>
<td>1.87</td>
<td>7.38</td>
<td>0.30</td>
<td>4.72</td>
</tr>
</tbody>
</table>

aThe Scheffe' method is used here to compare the means two at a time following an F test. This is a very rigorous criterion. After an F ratio has been calculated, it is compared with a quantity of $F'$, which is $F' = (k - l)F$. For any difference to be significant at the required level, $F$ must be greater than or equal to $F'$. The values of $F'$ required for significance at the .01 and .05 levels are 15.27 and 9.48 respectively.

Key: $A_1$ no tokens
      $B$ contingent tokens
      $A_2$ no tokens (extinction)
      $C$ non-contingent tokens

*Significant beyond the .05 level.
**Significant beyond the .01 level.
beyond the .01 level. However, no subjects emitted a significantly higher frequency of therapeutic responses under the phase of non-contingent token reinforcement than under a phase of no tokens.

Duration of therapeutic responses. Figure 4 portrays a comparison of the mean duration of therapeutic responses from each session for the three groups. The comparison on this graph supports the hypothesis that the duration of therapeutic responses increased under the conditions of contingent and non-contingent token reinforcement, and more so under the conditions of contingent token reinforcement. Individual graphs on each of the subjects from these groups also support the hypotheses for all the subjects. These individual graphs can be found in Appendix E.

F ratios of 22.93 for Group I and 23.56 for Group II indicated that the difference of the mean duration of therapeutic responses among the four phases was significant beyond the .01 level.

Individual intra-subject analyses of variance on the 10 subjects in Groups I and II indicated that the difference of the mean duration of therapeutic responses among the 4 phases was significant for 8 of the 10 subjects. Seven of these eight had F ratios significant beyond the .01 level; one was significant beyond the .05 level.

Table 3 summarizes these intra-subject and intra-group analyses of variance comparing the mean durations of therapeutic responses among the four experimental phases.

The Scheffe' method was used to test the comparisons of the means from each phase, two at a time, for Groups I and II on the duration of therapeutic responses in each phase. These results indicated that both Group I and Group II and six of their ten subjects emitted longer
Figure 4. A comparison of the mean duration (in seconds) of therapeutic responses for the three groups.
Table 3. Summary of intra-group and intra-subject analyses of variance comparing the mean duration (in seconds) of therapeutic responses as observed within the four experimental phases.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean (N=7)</th>
<th>Mean (N=5)</th>
<th>Mean (N=5)</th>
<th>Mean (N=5)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline Phase</td>
<td>Contingent Phase</td>
<td>Extinction Phase</td>
<td>Non-contingent Phase</td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>11.28</td>
<td>269.6</td>
<td>58.0</td>
<td>71.40</td>
<td>22.93**</td>
</tr>
<tr>
<td>S: I-1</td>
<td>0.00</td>
<td>34.6</td>
<td>0.0</td>
<td>2.8</td>
<td>11.64**</td>
</tr>
<tr>
<td>S: I-2</td>
<td>0.71</td>
<td>139.6</td>
<td>27.8</td>
<td>51.6</td>
<td>12.59**</td>
</tr>
<tr>
<td>S: I-3</td>
<td>0.00</td>
<td>41.8</td>
<td>9.2</td>
<td>7.4</td>
<td>25.09**</td>
</tr>
<tr>
<td>S: I-4</td>
<td>0.00</td>
<td>7.8</td>
<td>1.0</td>
<td>0.0</td>
<td>4.86*</td>
</tr>
<tr>
<td>S: I-5</td>
<td>26.28</td>
<td>59.4</td>
<td>20.0</td>
<td>9.6</td>
<td>5.36**</td>
</tr>
</tbody>
</table>

| Group II | 45.42 | 85.8 | 21.2 | 253.2 | 23.56** |
| S: II-1  | 0.71 | 10.4 | 2.6 | 26.4 | 19.80** |
| S: II-2  | 24.57 | 19.8 | 5.6 | 95.6 | 29.00** |
| S: II-3  | 15.42 | 16.8 | 12.4 | 94.0 | 7.83** |
| S: II-4  | 1.28 | 27.4 | 1.0 | 29.6 | 1.57 |
| S: II-5  | 1.85 | 6.4 | 0.0 | 7.6 | 2.62 |

*aRepresents the number of sessions.

**Significant beyond the .01 level.

*Significant beyond the .05 level.
durations of therapeutic responses in the contingent token phase than compared to the baseline phase, significant beyond the .01 level; an additional subject's difference was significant beyond the .05 level.

Further comparisons of these means indicate that both Groups I and II, as a whole, and eight of these ten subjects emitted a longer mean duration of therapeutic responses under the phase of contingent tokens than under a phase of non-contingent tokens, significant at least beyond the .05 level, and for four of the subjects and both the groups significant beyond the .01 level. There were no significant differences in the mean duration of therapeutic responses in either the groups or the subjects between the phases of non-contingent tokens and no tokens.

Table 4 summarizes these comparisons of means of the duration of therapeutic responses in each phase.

Comparison of the three groups verbal behaviors

Frequency of therapeutic responses among the groups. A one-way analysis of variance comparing the mean frequency of therapeutic responses among the three groups yielded an F ratio of 6.62, significant beyond the .01 level. The means for the three groups of the frequency of the therapeutic responses for all the sessions combined were:

- Group I - 34.36
- Group II - 29.86
- Group III - 1.25

Comparing the means of the three groups using the Scheffe' method indicated that there were significantly higher frequencies of therapeutic responses in Groups I and II than in Group III. The F ratio between Groups I and III was 11.79, significant beyond the .01 level; the F ratio between Groups II and III was 8.8, significant beyond the .05 level. This supported the predicted expectations.

These results are summarized in Table 5.
Table 4. Comparisons of the means of the duration of therapeutic responses in each phasea.

<table>
<thead>
<tr>
<th>Subject</th>
<th>PHASES</th>
<th>PHASES</th>
<th>PHASES</th>
<th>PHASES</th>
<th>PHASES</th>
<th>PHASES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A₁ &amp; B</td>
<td>A₁ &amp; A₂</td>
<td>A₁ &amp; C</td>
<td>B &amp; A₂</td>
<td>B &amp; C</td>
<td>A₂ &amp; C</td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S: I-1</td>
<td>63.42**</td>
<td>2.07</td>
<td>3.43</td>
<td>36.47**</td>
<td>32.00**</td>
<td>0.14</td>
</tr>
<tr>
<td>S: I-2</td>
<td>27.59**</td>
<td>0.00</td>
<td>0.18</td>
<td>23.64**</td>
<td>19.97**</td>
<td>0.15</td>
</tr>
<tr>
<td>S: I-3</td>
<td>35.65**</td>
<td>1.35</td>
<td>4.78</td>
<td>19.80**</td>
<td>12.26*</td>
<td>0.18</td>
</tr>
<tr>
<td>S: I-4</td>
<td>69.06**</td>
<td>3.34</td>
<td>2.16</td>
<td>36.00**</td>
<td>40.08**</td>
<td>0.10</td>
</tr>
<tr>
<td>S: I-5</td>
<td>11.72*</td>
<td>0.19</td>
<td>0.00</td>
<td>0.00</td>
<td>10.03*</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>5.95</td>
<td>0.21</td>
<td>1.51</td>
<td>7.22</td>
<td>11.54*</td>
<td>0.50</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S: II-1</td>
<td>52.36**</td>
<td>0.71</td>
<td>1.97</td>
<td>55.96**</td>
<td>29.13**</td>
<td>4.33</td>
</tr>
<tr>
<td>S: II-2</td>
<td>51.80**</td>
<td>0.28</td>
<td>7.36</td>
<td>38.11**</td>
<td>17.22**</td>
<td>4.09</td>
</tr>
<tr>
<td>S: II-3</td>
<td>52.05**</td>
<td>3.71</td>
<td>0.23</td>
<td>71.63**</td>
<td>50.81**</td>
<td>1.78</td>
</tr>
<tr>
<td>S: II-4</td>
<td>17.60**</td>
<td>0.02</td>
<td>0.01</td>
<td>16.17**</td>
<td>14.48*</td>
<td>0.04</td>
</tr>
<tr>
<td>S: II-5</td>
<td>2.70</td>
<td>0.00</td>
<td>2.29</td>
<td>2.36</td>
<td>0.01</td>
<td>2.01</td>
</tr>
<tr>
<td></td>
<td>3.71</td>
<td>0.38</td>
<td>2.33</td>
<td>5.56</td>
<td>0.14</td>
<td>3.95</td>
</tr>
</tbody>
</table>

---

*aSee similar footnote on Table 2.
*Significant beyond the .05 level.
**Significant beyond the .01 level.

Key:  
A₁ - no tokens (baseline)  
B - contingent tokens  
A₂ - no tokens (extinction)  
C - non-contingent tokens
Table 5. Analysis of variance and comparison of means of the frequency of therapeutic responses among the three groups.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59</td>
<td>1,024.95</td>
<td></td>
</tr>
<tr>
<td>Among the Means</td>
<td>2</td>
<td>5,699.74</td>
<td>6.62**</td>
</tr>
<tr>
<td>Within</td>
<td>57</td>
<td>860.92</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison of Group Means</th>
<th>F_a</th>
</tr>
</thead>
<tbody>
<tr>
<td>I &amp; II</td>
<td>0.25</td>
</tr>
<tr>
<td>I &amp; III</td>
<td>11.79**</td>
</tr>
<tr>
<td>II &amp; III</td>
<td>8.80*</td>
</tr>
</tbody>
</table>

**Significant beyond the .01 level.
*Significant beyond the .05 level.

The Scheffe’ method is used here to compare the means two at a time following a significant F test. After an F ratio has been calculated, it is compared with a quantity of F', which is F' = (k - 1)F. For any difference to be significant at the required level, F must be greater than or equal to F'. The values of F' required for significance at the .01 level and .05 level are: 10.00 and 6.32 respectively.
**Duration of therapeutic responses among the groups.** A one-way analysis of variance comparing the mean duration of therapeutic responses among the three groups yielded an F ratio of 5.98, significant beyond the .01 level. The means for the three groups of the duration of therapeutic responses for all the sessions combined were: Group I - 94.27 seconds, Group II - 96.31 seconds, and Group III - 2.63 seconds.

Comparing the means of the three groups using the Scheffe' method indicated that there were significantly longer durations of therapeutic responses in Groups I and II than in Group III. The F ratio between Groups I and III was 9.24, significant beyond the .05 level; the F ratio between Groups II and III was 9.65, significant beyond the .05 level. This supported the predicted expectations.

These results are summarized in Table 6.

**Frequency of talk responses among the groups.** A one-way analysis of variance comparing the mean frequencies of talk responses among the three groups yielded an F ratio of 39.18 significant beyond the .01 level. The means for the three groups of the frequency of talk responses for all the sessions combined were: Group I - 239.59, Group II - 273.72, and Group III - 133.0.

Comparing the means of the three groups using the Scheffe' method indicated that there were significantly higher frequencies of talk responses in Groups I and II than Group III. The F ratio between Groups I and III was 42.89, significant beyond the .01 level; the F ratio between Groups II and III was 74.78, significant beyond the .01 level.

These results are summarized in Table 7. Figure 5 portrays a comparison of the mean frequencies of talk responses from each session for the three groups.
Table 6. Analysis of variance and comparison of means of the duration (in seconds) of therapeutic responses among the three groups.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59</td>
<td>9,841.60</td>
<td></td>
</tr>
<tr>
<td>Among the Means</td>
<td>2</td>
<td>50,406.84</td>
<td>5.98**</td>
</tr>
<tr>
<td>Within</td>
<td>57</td>
<td>8,418.33</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of Group Means

- I & II: 0.01
- I & III: 9.24*
- II & III: 9.65*

**Significant beyond the .01 level.
*Significant beyond the .05 level.

The Scheffe' method is used here to compare the means two at a time following a significant F test. After an F ratio has been calculated, it is compared with a quantity of $F'$, which is $F' = (k - 1)F$. For any difference to be significant at the required level, $F$ must be greater than or equal to $F'$. The values of $F'$ required for significance at the .01 and .05 level are: 10.00 and 6.32 respectively.
Table 7. Analysis of variance and comparison of means of the frequency of talk responses among the three groups

<table>
<thead>
<tr>
<th>Group:</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean:</td>
<td>239.59</td>
<td>273.72</td>
<td>133.06</td>
</tr>
<tr>
<td>No. of Sessions:</td>
<td>22</td>
<td>22</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59</td>
<td>5,622.73</td>
<td></td>
</tr>
<tr>
<td>Among the Means</td>
<td>2</td>
<td>96,028.50</td>
<td>39.18**</td>
</tr>
<tr>
<td>Within</td>
<td>57</td>
<td>2,450.59</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of Group Means

<table>
<thead>
<tr>
<th></th>
<th>F&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>I &amp; II</td>
<td>5.22</td>
</tr>
<tr>
<td>I &amp; III</td>
<td>42.89**</td>
</tr>
<tr>
<td>II &amp; III</td>
<td>74.78**</td>
</tr>
</tbody>
</table>

**Significant beyond the .01 level.

<sup>a</sup>The Scheffe<sup>'</sup> method is used here to compare the means two at a time following a significant F test. After an F ratio has been calculated, it is compared with a quantity of F', which is F' = (k - 1)F. For any difference to be significant at the required level, F must be greater than or equal to F'. The value of F' required for significance at the .01 level is 10.00.
Figure 5. A comparison of the mean frequencies of talk responses for the three groups.
Duration of talk responses among the groups. A one-way analysis of variance comparing the mean duration of talk responses among the three groups yielded an F ratio of 1.34, which was not significant. The means for the three groups of the duration of talk responses for all sessions combined were: Group I - 995.36 seconds, Group II - 1011.27 seconds, and Group III - 856.62 seconds.

These results are summarized in Table 8. Figure 6 portrays a comparison of the mean duration of talk responses from each session for the three groups.

Outcome measures

The MACC Behavioral Adjustment Scale. An analysis of covariance statistical design comparing the post-tests of the three experimental groups on the MACC, using the pre-test as the covariate, yielded an F ratio of .58. This was not significant, with two degrees of freedom for the between-group variance estimate and eleven degrees of freedom for the within-subject variance estimate.

The mean scores for the pre- and post-test ratings for the three groups were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre</td>
<td>67.6</td>
<td>68.6</td>
<td>69.6</td>
</tr>
<tr>
<td>post</td>
<td>78.0</td>
<td>75.0</td>
<td>80.0</td>
</tr>
</tbody>
</table>

Additional one-tailed t-tests were computed comparing the differences between the mean pre- and post-test ratings for each group, as well as for all the subjects as a whole. A t-test comparing the pre- and post-test means for Group I yielded a ratio of 2.61, significant beyond the .05 level with four degrees of freedom.
Table 8. Analysis of variance and means for the duration (in seconds) of talk responses among the three groups.

<table>
<thead>
<tr>
<th>Group:</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean:</td>
<td>995.36</td>
<td>1011.27</td>
<td>856.62</td>
</tr>
<tr>
<td>No. of Sessions</td>
<td>22</td>
<td>22</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59</td>
<td>95,780.51</td>
<td></td>
</tr>
<tr>
<td>Among the Means</td>
<td>2</td>
<td>127,635.50</td>
<td>1.34 ns</td>
</tr>
<tr>
<td>Within</td>
<td>57</td>
<td>94,662.79</td>
<td></td>
</tr>
</tbody>
</table>
Figure 6. A comparison of the mean duration (in minutes) of talk responses for the three groups.

KEY: Group I: __ Group II: - - - - Group III: ....
A t-test comparing the pre- and post-test means of Group II yielded a ratio of 3.44, significant beyond the .025 level with four degrees of freedom.

A t-test comparing the pre- and post-test means of Group III yielded a ratio of 2.70, significant beyond the .05 level with four degrees of freedom.

A t-test comparing the pre- and post-test means for all 15 subjects yielded a ratio of 4.84, significant beyond the .01 level with 14 degrees of freedom.

In summary, each group as well as all the subjects, as a whole, were rated significantly higher on the post-test of the MACC scale (i.e. total ward adjustment) as compared to pre-test ratings. However, there were no significant differences among the mean post ratings of the three groups using the pre-test ratings as the covariate.

HIM-B. An analysis of covariance statistical design comparing the post-tests of the three experimental groups on the HIM-B, using the pre-test as the covariate, yielded an F ratio of .45. This was not significant, with two degrees of freedom for the between-group variance estimate and eleven degrees of freedom for the within-subject variance estimate.

The mean scores for the pre- and post-tests for the three groups were as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>pre</th>
<th>post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>30.2</td>
<td>37.8</td>
</tr>
<tr>
<td>Group II</td>
<td>83.0</td>
<td>87.8</td>
</tr>
<tr>
<td>Group III</td>
<td>71.2</td>
<td>83.0</td>
</tr>
</tbody>
</table>

Additional one-tailed t-tests were computed comparing the difference between the mean pre- and post-test scores for each group, as
well as for all the subjects as a whole. A t-test comparing the pre- and post-test means of Group I yielded a ratio of 1.67, significant beyond the .10 level with four degrees of freedom.

A t-test comparing the pre- and post-test means of Group II yielded a ratio of .58, this was not significant with four degrees of freedom.

A t-test comparing the pre- and post-test means of Group III yielded a ratio of 2.47, significant beyond the .05 level with four degrees of freedom.

A t-test comparing the pre- and post-test means for all 15 subjects yielded a ratio of 2.41, significant beyond the .025 level with 14 degrees of freedom.

In summary, Groups I and II, as well as all of the subjects considered as a whole, tended to score higher on the post-tests of the HFM-B (i.e. a preference to explore all areas of group interaction) as compared to their pre-test scores. However, there were no significant differences among the mean post scores of the three groups using the pre-test as a covariate.
CHAPTER V

DISCUSSION

The major objective of this study was to use a token operant conditioning technique to facilitate a style of verbal interaction, i.e. therapeutic responses as defined by the Hill Interaction Matrix, in a group setting of chronic psychiatric patients. A secondary objective was to examine possible effects upon selected outcome measures comparing the groups receiving token reinforcement with a control group not receiving tokens.

Hypotheses

The results supported the hypotheses that therapeutic responses did occur significantly more frequently and for longer durations in Groups I and II, in the following predicted directions: (1) under conditions of contingent token reinforcement as compared to conditions of non-contingent token reinforcement and conditions of no tokens (i.e. baseline and extinction phases); (2) in Groups I and II receiving the conditioning procedures as compared to a control group receiving no tokens.

The hypothesis stating therapeutic responses would occur more frequently and for longer durations under conditions of non-contingent token reinforcement than under conditions of no tokens was not statistically supported.

The results did not support the hypotheses that Groups I and II would score significantly higher on the post-tests of the HIM-B and the
MACC, using the pre-tests as the covariate, than would Group III. In other words, there were no indications that groups having received token reinforcement scored any higher on the following outcome measures: (1) The MACC Behavioral Adjustment Scale, a measure of ward adjustment; and (2) the HIM-B, a measure of preference toward group interaction.

**Relationship of therapeutic responses to talk responses.** Figures 3 and 4 (see pages 57 and 62) illustrate that for Groups I and II there appears to be a functional relationship between contingent token reinforcement and the increase in the frequency and duration of therapeutic responses; also, a functional relationship between baseline and extinction phases and a decrease in the frequency and duration of therapeutic responses.

Figures 5 and 6 (see pages 70 and 73) illustrate that for Groups I and II there doesn't appear to be a functional relationship between the frequency and duration of talk responses with any of the experimental phases.

Over 14 percent of all the verbal responses from all the sessions in Group I were rated as therapeutic responses; similarly, approximately 11 percent of all the verbal responses in Group II were therapeutic responses. However, less than 1 percent of all the verbal responses in Group III (control group) were therapeutic responses. Further, during the phases of contingent token reinforcement in Groups I and II the percentage of therapeutic responses as compared to all verbal responses increased to approximately 36 percent and 24 percent, respectively.

These percentages and the figures in Chapter IV indicate there appears to be a functional relationship between contingent token reinforcement and the increase of therapeutic responses as compared to the
more or less random variation of talk responses across the experimental phases.

Comparison of the three groups' verbal responses. Groups I and II, as a whole, did have higher frequencies and longer durations of therapeutic responses than did Group III. This indicates that the groups receiving token reinforcement contingent upon the target behavior, i.e., therapeutic responses, increased on this target behavior compared with a group not receiving the tokens. This relationship appears to be fairly obvious.

Among the three groups there was also a higher frequency of talk responses in Groups I and II than in the control group; however, there wasn't a longer duration of talk responses. A talk response was defined as any verbal initiation of at least three or more words. What these results suggest is that in groups receiving token reinforcement there tended to be an increase in their frequency of verbal initiations. One might speculate that subjects in Groups I and II were initiating more verbal behavior, even though not always at a therapeutic level, in order to increase their chances of receiving token reinforcement. This finding agrees with previous research in which verbal initiations and responses were increased by means of token reinforcement (Alumbaugh, 1971; Hauserman, et al., 1972).

Target verbal response class. An important aspect of this experiment was the target verbal response class which was chosen to be conditioned, i.e. therapeutic responses as defined by Quadrant IV of the Hill Interaction Matrix. In as much as this is a particular style of group interaction, this experiment has demonstrated a means of increasing not only the frequency of a verbal response, but the quality of that response as well.
Earlier studies that attempted to condition verbal behaviors in groups of chronic psychiatric patients have usually focused on less complex types of responses, such as: verbal initiations, positive self-reference statements, feeling statements, continuous speech, and so forth. The present study indicates the use of operant principles to condition a style of group interaction with psychiatric patients that is problem-solving oriented for personal and interpersonal types of problems.

This study expands an earlier study by Roffer (1969) which conditioned a confrontive style of verbal interaction, as defined by the Hill Interaction Matrix, with college students. The present study demonstrated that a similar style of interaction can be conditioned with a sample of psychiatric patients.

The MACC Behavioral Adjustment Scale. No relationship was found to indicate that subjects conditioned to emit therapeutic responses in group therapy would be rated as more improved on a scale measuring ward adjustment, than subjects in a control group. Nevertheless, most of the subjects within the three groups were rated significantly higher on their total ward adjustment following participation in the experiment. One would question what this improvement in ward adjustment was attributed to.

One possible explanation could be due to the placebo effect. The patients realized they were being studied, and each day for approximately three weeks they received the extra attention of going to the research room to participate in the groups. This extra attention may have had as much of an effect on the patients' ward behaviors and their attitudes as did any of the experimental procedures.
In that the MACC scale is a behavior rating scale completed by nurse aides and attendants, the scale may reflect as much about them as raters as it does about the actual behavior of the patients on the wards. For some unknown reason the raters did generally see the patients as having improved on the items measured by the MACC scale: motility, affect, cooperation, and communication. Perhaps this was an actual improvement that the patients did become generally more adjusted on the ward from participating in the experimental therapy groups; however, it may have been uncontrolled rater bias that effected the improved ratings. In other words, the raters may have rated the patients higher because that was what they thought was expected in the experiment. Whatever it was, it remains difficult from available data to explain this improvement from the pre- to post-ratings. Nevertheless there were no differential effects among the three groups, and consequently the hypothesis could not be supported that patients in groups conditioned to emit therapeutic responses would improve significantly more than a control group on their ratings of ward adjustment.

**HIM-B.** No relationship was found that indicated that subjects conditioned to emit therapeutic responses in group therapy would score higher on a test measuring their preferences toward group interaction than subjects in a control group. Generally, all the patients did tend to score higher on the post-test of the HIM-B; this may reflect that merely participation in a group experience expands an individual's preference to explore other areas of group interaction.

An interesting relationship occurred in that Group III (control group) had the greatest significant difference between the mean pre- and post-test scores, significant beyond the .05 level; while on the
other hand this group had the fewest therapeutic responses. This discrepancy between the groups' increased preferences toward exploring all areas of group interaction and their actual performance indicates that perhaps the HIM-B may not be effective in reflecting how an individual will perform in a group.

Further considerations and criticisms

The experimental design. The use of the "ABA" experimental design for Groups I and II provided an effective means of illustrating the functional relationship between the use of contingent token reinforcement upon increasing the frequency and duration of therapeutic responses. Not only did each group as a whole, but each of the 10 subjects in Groups I and II, provided support that the tokens, and particularly contingent tokens, did increase the frequency and duration of therapeutic responses.

In addition to providing graphic illustration of the effects of contingent and non-contingent token reinforcement upon therapeutic responses, the use of the one-way, intra-subject analysis of variance provided a means of statistically testing whether the changes in the frequency and duration of therapeutic responses between phases were significant or chance variations.

One major criticism of using the control group was the lack of a therapist or some means of treatment to avoid that group stagnating. After 16 sessions, Group III was terminated because there had been no therapeutic responses for the last 7 sessions, and to prevent any debilitating effects on the patients in that group.

Consequently, the difference in the number of sessions between the control group and the experimental groups constitutes a possibility
that accurate comparisons between the three groups are difficult to make. Even though random placement, as well as statistical controls were used to equalize differences among the three groups, because of the small size of the groups there may have still been some uneven distributions according to sex, length of hospitalization, primary diagnosis, and age that might have affected the results.

The yoked-control technique. This was an effective means to assess the effects of tokens on the target response. The technique was used in Groups I and II in order to assess the effects of dispensing tokens under conditions of contingent reinforcement as compared to non-contingent reinforcement. The results supported for 7 out of the 10 subjects from Groups I and II there were significantly higher frequencies of therapeutic responses under conditions of contingent token reinforcement than under conditions of non-contingent token reinforcement. Similarly, for 8 out of the 10 subjects there were significantly longer mean durations of therapeutic responses than under conditions of non-contingent token reinforcement. These results indicate that the contingent token reinforcement did have a significant specific effect of increasing therapeutic responses.

Pre- and post-testing. This was intended to be used as a means to assess what effects the groups having received token reinforcement would have on selected outcome measures as compared to a control group not receiving tokens. In this study there were some problems inherent in using these outcome measures. First of all, it would have been impossible to determine a cause and effect relationship between the experimental procedures and the outcome measures, at best only a correlational relationship could have been determined.
Secondly, the MACC scale required hospital aides and attendants to do the ratings. No measures were taken to insure an adequate check on interrater reliabilities, and consequently the ratings obtained from the two raters on each subject were often discrepant with each other. At best this was controlled by combining the two sets of ratings on each subject; nonetheless, without adequate training and reliability checks on these aides and attendants the validity of the results remains doubtful. Part of the reason that this training and reliability checks were not obtained was due to sacrificing experimental rigor in order to gain the cooperation of hospital staff with the experiment.

Ideally these outcome measures could have assessed any generalization effects of the reinforced response class upon some measure outside of the experimental setting. However, a more adequate means to examine generalization effects might have been to examine the occurrence of the reinforced therapeutic response in another setting, such as the ward, another group setting, or even in an individual therapy setting.

In conclusion, even though these outcome measures were used in this study and have been used in similar previous studies, the general lack of significance obtained suggests that they appear to be inadequate in assessing the effects, if any, of a treatment procedure such as token reinforcement, outside of the conditioning setting.

Implications of the results

These results extend the "application stage" of research in the area of verbal conditioning. This study has demonstrated that operant principles can be used in a group setting of chronic psychiatric patients in order to modify their style of verbal interaction. Of particular significance is that a quality of verbal style was
conditioned that is generally atypical for the subjects involved in this study.

Further, this study has supported the use of the Hill Interaction Matrix as an effective tool for classifying a style of verbal responses that can be targeted and modified. As researchers gain the means to pinpoint certain styles and qualities of verbal responses, such as the HIM does, it will open up new possibilities of verbal responses that can be studied and be experimentally manipulated.

In the area of group therapy research, this study has demonstrated one way in which the process of the group can be controlled and observed in the experimental setting.

The results have implications for the area of behavior modification in terms of the types of verbal responses that can be conditioned, as well as uses for token reinforcement in group situations. Also, in the area of counseling and psychotherapy, there are implications for methods of teaching and facilitating therapeutic interaction with individuals who have little propensity for being involved in individual and group talk-therapies. Particularly, this opens up a method of facilitating a style of verbal interaction among subjects who are typically withdrawn, passive, and generally non-verbal. In no means does this suggest a solution to the problems of the psychiatric patient; however, it does suggest a technique and the use of the group setting as a potential confrontation point where a therapist can begin to initiate a therapy relationship with chronic psychiatric patients in order to begin working with them to solve personal and interpersonal problems.
Recommendations

Two recommendations have grown out of unanswered questions raised by this study; both concern the need for further clarification of what generalization effects occur from conditioning therapeutic responses.

First of all, future research needs to assess and clarify what generalization effects may occur after having increased the therapeutic responses within the experimental (treatment) setting. A logical point of inquiry would be to examine whether therapeutic responses will generalize and continue to occur in situations in which tangible reinforcers are discontinued, and to settings other than the experimental setting. A goal of these efforts would be to condition a style of verbal, problem-solving behavior that would maintain itself in the natural environment.

Secondly, further research needs to discover appropriate outcome measures that will assess the potential therapeutic benefits that might be derived from talking in a therapeutic manner. In order to justify the benefits that may be derived from effective group and individual therapy, researchers need to discover what the relationships are that exist between the verbal behavior which occurs within the therapeutic session and the behaviors and attitudes of the individual in the natural environment.
LITERATURE CITED


Lindsley, O. R. Operant conditioning methods applied to research in schizophrenia. *Psychiatric Research Reports*, 1956, 5, 118-139.


Oakes, W. F. Reinforcement of Bales' categories in group discussion. *Psychological Reports*, 1962, 11, 427-435. (a)

Oakes, W. F. Effectiveness of signal light reinforcers given various meanings on participation in group discussion. *Psychological Reports*, 1962, 11, 469-470. (b)


### Appendix A

Age, Length of Hospitalization, Sex and Diagnosis for the 15 Patients Studied in This Experiment

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Length of Hospitalization*</th>
<th>Sex</th>
<th>Diagnosis</th>
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<tr>
<td>S: I-1</td>
<td>53</td>
<td>153 days</td>
<td>F</td>
<td>Schizophrenic reaction, paranoid type, chronic</td>
</tr>
<tr>
<td>S: I-2</td>
<td>66</td>
<td>5 yr. 281 days</td>
<td>M</td>
<td>Passive aggressive personality</td>
</tr>
<tr>
<td>S: I-3</td>
<td>49</td>
<td>342 days</td>
<td>F</td>
<td>Schizophrenic reaction, chronic undifferentiated type</td>
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<td>S: I-4</td>
<td>26</td>
<td>3 yr. 167 days</td>
<td>F</td>
<td>Schizophrenic reaction, paranoid type</td>
</tr>
<tr>
<td>S: I-5</td>
<td>18</td>
<td>255 days</td>
<td>F</td>
<td>Mental deficiency</td>
</tr>
<tr>
<td>S: II-1</td>
<td>44</td>
<td>178 days</td>
<td>M</td>
<td>Schizophrenic reaction, paranoid type, chronic</td>
</tr>
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<td>S: II-2</td>
<td>31</td>
<td>269 days</td>
<td>F</td>
<td>Schizophrenic reaction, chronic</td>
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<td>S: II-3</td>
<td>21</td>
<td>1 yr. 69 days</td>
<td>F</td>
<td>Schizophrenic reaction, chronic undifferentiated type</td>
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<tr>
<td>S: II-4</td>
<td>17</td>
<td>182 days</td>
<td>F</td>
<td>Non-psychotic organic brain syndrome with brain trauma</td>
</tr>
<tr>
<td>S: II-5</td>
<td>48</td>
<td>253 days</td>
<td>F</td>
<td>Schizophrenic reaction, paranoid type</td>
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<td>S: III-1</td>
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<td>147 days</td>
<td>M</td>
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<td>26</td>
<td>241 days</td>
<td>M</td>
<td>Schizophrenic reaction, chronic undifferentiated type</td>
</tr>
<tr>
<td>S: III-3</td>
<td>58</td>
<td>4 yr. 191 days</td>
<td>F</td>
<td>Non-psychotic, organic brain syndrome, with epilepsy</td>
</tr>
<tr>
<td>S: III-4</td>
<td>50</td>
<td>137 days</td>
<td>M</td>
<td>Psychosis with brain trauma</td>
</tr>
<tr>
<td>S: III-5</td>
<td>24</td>
<td>226 days</td>
<td>M</td>
<td>Schizophrenic reaction, chronic undifferentiated type</td>
</tr>
</tbody>
</table>

*Admissions to Wyoming State Hospital only.

yr. = years
Appendix B

INSTRUCTIONS: Each statement has six alternative answers. Select the one that comes nearest representing your reaction or feeling about the statement as it applies to you. Circle the selected item. Read each item carefully. Do not spend a lot of time on any item. Your reaction is what is desired.

1. I talk to people about my background; family, school, work, etc.
   most people many people some people few people one or two people nobody

2. I tell other people specifically what kind of reactions I have toward them when they ask me.
   most people many people some people few people one or two people nobody

3. I like to discuss Psychology with people.
   most people many people some people few people one or two people nobody

4. I side in with people who say they are getting a raw deal.
   most people many people some people few people one or two people nobody

5. In a group I'd ask questions about how one member reacts to another.
   usually often sometimes occasionally rarely never

6. I'm interested in what kind of things motivate people.
   usually often sometimes occasionally rarely never

7. People need to be told off regularly.
   most people many people some people few people one or two people nobody

8. When a group is having trouble operating, I figure out what's wrong with the group and propose solutions.
   usually often sometimes occasionally rarely never

9. I ask for or give summaries and restatements of what's said.
   usually often sometimes occasionally rarely never

10. I am sarcastic to people.
    most people many people some people few people one or two people nobody

11. I try to support and encourage other people.
    most people many people some people few people one or two people nobody
Appendix B. Continued

12. When people point out examples of my immature, irrational or inadequate behavior I try to profit by this.
   usually often sometimes occasionally rarely never

13. Even though my ideas are unpopular I tend to uphold them.
   usually often sometimes occasionally rarely never

    most people many people some people few people
    one or two people nobody

15. I like to know something about the background of people.
    most people many people some people few people
    one or two people nobody

16. I let people know what I think of them.
    usually often sometimes occasionally rarely never

17. I offer suggestions as to how a group might improve its functioning.
    usually often sometimes occasionally rarely never

18. I'm willing to seek help from people for my personal problems.
    most people many people some people few people
    one or two people nobody

19. I like people who initiate and plan group activities.
    most people many people some people few people
    one or two people nobody

20. When groups try to solve people's problems it's a case of the "blind leading the blind."
    usually often sometimes occasionally rarely never

21. If conflicting goals are fouling up a group I will point this out.
    usually often sometimes occasionally rarely never

22. Groups tend to get off the subject and wander all over.
    usually often sometimes occasionally rarely never

23. I try to get people to honestly examine the kind of relationships they form with others.
    most people many people some people few people
    one or two people nobody

24. I like to discuss current events.
    usually often sometimes occasionally rarely never

25. I help plan a group's activities.
    usually often sometimes occasionally rarely never
Appendix B Continued

26. I like to chat with people.
   most people  many people  some people  few people
   one or two people  nobody

27. I openly criticize the policies of those in charge or in position
    of authority.
    usually  often  sometimes  occasionally  rarely  never

28. I try to integrate or synthesize and pull together divergent
    opinions or ideas expressed in a group.
    usually  often  sometimes  occasionally  rarely  never

29. I like to discuss what causes various kinds of emotional upsets
    and mental illnesses.
    usually  often  sometimes  occasionally  rarely  never

30. I compare the group I'm in with other groups I've known.
    usually  often  sometimes  occasionally  rarely  never

31. I try to help people with their personal problems.
    usually  often  sometimes  occasionally  rarely  never

32. I retaliate when people point out my weaknesses.
    usually  often  sometimes  occasionally  rarely  never

33. When people talk about their problems I like to bring the
    discussion around to the principles or types of behavior that
    are illustrated by these problems.
    usually  often  sometimes  occasionally  rarely  never

34. I share with the group my observations of its function and its
    subsequent failures.
    usually  often  sometimes  occasionally  rarely  never

35. I point out discrepancies or contradictions between peoples
    behavior and what they say they're like.
    usually  often  sometimes  occasionally  rarely  never

36. I like for others to help me understand myself.
    usually  often  sometimes  occasionally  rarely  never

37. I'm the one who asks what are the plans and procedures of the
    group.
    usually  often  sometimes  occasionally  rarely  never

38. I like to praise people.
    usually  often  sometimes  occasionally  rarely  never

39. I disagree with the way groups tend to operate.
    usually  often  sometimes  occasionally  rarely  never
Appendix B Continued

40. I make fun of people.
   usually  often  sometimes  occasionally  rarely  never

41. I'm interested in people.
   usually  often  sometimes  occasionally  rarely  never

42. It is my responsibility to give group members an honest statement
    of how I react to them even if it may hurt their feelings.
   usually  often  sometimes  occasionally  rarely  never

43. I'm willing to share details of my private life with people.
   most people  many people  some people  few people
   one or two people  nobody

44. When I tell people how I react to them I try to do so but in a way
    that doesn't hurt their feelings.
   usually  often  sometimes  occasionally  rarely  never

45. I try to clarify or pull out some conclusions for the group when it
    gets bogged down or confused in discussing a topic.
   usually  often  sometimes  occasionally  rarely  never

46. When a member's behavior prevents or inhibits a group's progress,
    I point out to the group the effect of his behavior.
   usually  often  sometimes  occasionally  rarely  never

47. I try to find out what kind of reactions my behavior produces on
    other individuals.
   usually  often  sometimes  occasionally  rarely  never

48. I like to exchange gossip.
   usually  often  sometimes  occasionally  rarely  never

49. I like to kid with people.
   usually  often  sometimes  occasionally  rarely  never

50. I try to get people to discuss the kinds of defenses and
    psychological principles that their behavior illustrates.
   usually  often  sometimes  occasionally  rarely  never

51. People have pretty foggy notions on most controversial issues.
    most people  many people  some people  few people
    one or two people  nobody

52. I like to offer observations about the group's performance.
    usually  often  sometimes  occasionally  rarely  never

53. I like to get people to discuss how they feel about each other.
    usually  often  sometimes  occasionally  rarely  never
Appendix B Continued

54. People need to know more about Psychological and Psychiatric terms and concepts.
   most people many people some people few people
   one or two people nobody

55. I react negatively to suggestions implying that I change my personality.
   usually often sometimes occasionally rarely never

56. I try to get people to deal with their problems which they avoid.
   usually often sometimes occasionally rarely never

57. I like to argue with people.
   most people many people some people few people
   one or two people nobody

58. I like to be close and personal with people.
   most people many people some people few people
   one or two people nobody

59. People who talk about their troubles gripe me.
   most people many people some people few people
   one or two people nobody

60. I share with the group how I think we're doing.
   usually often sometimes occasionally rarely never

61. When people ask about how I react toward them I usually tell them something.
   most people many people some people few people
   one or two people nobody

62. I try to find out how people actually see me and see my problems.
   most people many people some people few people
   one or two people nobody

63. I like to socialize.
   usually often sometimes occasionally rarely never

64. I'm interested in people.
   most people many people some people few people
   one or two people nobody
Appendix C

Raw Data for Pre- and Post-tests

<table>
<thead>
<tr>
<th>Subject</th>
<th>Pre</th>
<th>Post</th>
<th>Him-B *</th>
<th>Pre</th>
<th>Post</th>
<th>Rater 1</th>
<th>Pre</th>
<th>Post</th>
<th>Rater 2</th>
<th>Pre</th>
<th>Post</th>
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<tr>
<td>S: I-1</td>
<td>3</td>
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<td>19</td>
<td>27</td>
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<td>46</td>
<td>51</td>
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*Total Preference Scores
**Total Ward Adjustment Scores
APPENDIX D

Frequency of Therapeutic Responses for Individual Subjects Under Varied Experimental Conditions
The diagram illustrates the frequency of therapeutic responses over sessions for three different subjects (S: I-1, S: I-2, S: I-3). The x-axis represents the sessions, ranging from 1 to 22, while the y-axis shows the frequency of responses ranging from 0 to 30.

- **S: I-1**: The response frequency remains relatively stable throughout the baseline and contingent tokens phases, and shows a slight increase during extinction. Non-contingent tokens show a gradual decrease.

- **S: I-2**: There is a noticeable increase in response frequency during the contingent tokens phase, followed by a decrease during extinction. The non-contingent tokens phase shows a moderate drop.

- **S: I-3**: The response frequency decreases steadily across the baseline, contingent tokens, and extinction phases. Non-contingent tokens show a slight increase.

The data suggests that contingent tokens and extinction procedures have varying impacts on the subjects' response frequencies.
The graph shows the frequency of therapeutic responses for two subjects (S: I-4 and S: I-5) across different conditions: Baseline, Contingent Tokens, Extinction, and Non-contingent Tokens. The x-axis represents sessions, ranging from 1 to 22, and the y-axis represents the frequency of responses, ranging from 0 to 30. The graph indicates trends in response frequency across these conditions for each subject.
FREQUENCY OF THERAPEUTIC RESPONSES

S: II-4

S: II-5

1 3 5 7 8 10 12 13 15 17 18 20 22
Baseline Non-contingent Tokens Extinction Contingent Tokens

SESSIONS
APPENDIX E

Duration (in Seconds) of Therapeutic Responses
for Individual Subjects Under Varied
Experimental Conditions
Baseline Contingent Tokens Extinction Non-contingent Tokens

SESSIONS
S: I-5

S: II-1

S: II-2

SESSIONS

Baseline Contingent Tokens Extinction Non-contingent Tokens

SESSIONS

Baseline Non-contingent Tokens Extinction Contingent Tokens
The graph shows the duration (in seconds) of therapeutic responses for three different subjects: S: II-3, S: II-4, and S: II-5. The x-axis represents the sessions, ranging from 1 to 22, while the y-axis shows the duration in seconds. The periods labeled are Baseline, Non-contingent Tokens, Extinction, and Contingent Tokens.

S: II-3 shows a significant reduction in response duration during extinction, followed by an increase in the contingent tokens phase.

S: II-4 demonstrates a steady decrease in response duration throughout the sessions, with a slight increase during the contingent tokens phase.

S: II-5 shows a relatively stable duration throughout the baselines and non-contingent tokens phases, with a minor increase during extinction and a gradual decrease in the contingent tokens phase.
VITA
Henry G. Martin
Candidate for the Degree of
Doctor of Philosophy

Dissertation: The Use of Token Reinforcement to Facilitate a Therapeutic Style of Verbal Interaction in Group Therapy of Psychiatric Patients

Major Field: Psychology

Biographical Information:

Personal Data: Born at South Bend, Indiana, October 21, 1947, son of John G. and Mary A. Martin; married Virginia E. Slack August 7, 1971.

Education: Attended elementary school in South Bend, Indiana, graduated from South Bend Central High School in 1966, received the Bachelor of Arts degree from Hanover College, Indiana, with a major in Psychology in 1970; received the Master of Science degree from Utah State University, Logan, Utah, in 1972 with a major emphasis in Psychology.

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