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A Verbal Behavior Analysis of Speech Patterns in Psychiatric Populations

Richard Lowell Steele
College of William & Mary - Arts & Sciences

A VERBAL BEHAVIOR ANALYSIS OF SPEECH PATTERNS IN PSYCHIATRIC POPULATIONS

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Richard L. Steele

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Peter L. Derks

W. Larry Ventis

Sloane W. Payne, Jr.

Stanley B. Williams

Ben A. Hammack
Chief Psychologist, Eastern State Hospital

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ABSTRACT

The purpose of this study was to determine to what extent paranoid schizophrenics, alcoholics, and schizophrenics lacking dominant paranoid traits differed from normal subjects in their use of particular verbal behaviors.

Samples of verbal behavior were collected from each subject by tape recording the subject's speech during two four-minute experimental speech periods. One speech period was designed to allow the subject freedom to select his own topic of discussion. In the second experimental situation the subject was shown a pictorial card of the Thematic Apperception Test and instructed to make-up and tell a story about that picture.

The subject's recorded talks were then scored on twelve verbal content and structure categories.

The results showed that for the verbal categories studied, the experimental speech situation, the psychiatric group involved, and the subject's sex were variables in producing significant differences in the quantitative use of certain speech behaviors.

Speech behaviors of the psychiatric groups were theorized as reflecting the operations of particular psychodynamics or mental defense mechanisms as construed by advocates of psychoanalytic theory.

A VERBAL BEHAVIOR ANALYSIS OF SPEECH PATTERNS IN PSYCHIATRIC POPULATIONS

INTRODUCTION

Language may not be unique to the human race but it is indispensable to human life as we are accustomed to it. Throughout his lifetime man's major engagement is language behavior. Language, therefore, is an integral part of human behavior and as such provides the material for answering the question, "Does a relationship exist between personality development and speech behavior?". If such a relationship in fact exists, does the structure of language correspond to a general psychological framework? These questions, quite simply stated, pose the nature of the problem chosen for investigation.

Speech communicates to others man's emotions, opinions, sensory experiences, feelings, plans, and relationships to objects in his external, as well as internal, world. Thus, speech is a behavioral function usually carried on between two or more people. To those of us who listen to verbal interactions of persons manifesting personality disorders speech behavior is relatively distinctive - both in structure and content. The manic talks incessantly and rapidly, paying little attention to his listener. The depressed patient proceeds slowly and monotonously, hardly diversifying his tempo, voice, or subject matter. The schizophrenic, speaking is disarranged forms, creates new words (neologisms) and frequently fails to convey his idiosyncratic meanings. The experimenter's interest in this phenomena is to investigate what, if any, particular speech characteristics

are consistently associated with specific psychiatric groups. This research endeavour is supported somewhat by Sullivan's (1970) statement that

> "Much attention may profitably be paid to the telltale aspects of intonation, rate of speech, difficulty in enunciation, and so on - factors which are conspicuous to any student of vocal communication. It is by alertness to the importance of these things as signs or indicators of meaning, rather than by preoccupation only with the words spoken, that the psychiatric interview becomes practical in a reasonable section of one's lifetime."

Since we know that psychological judgments about an individual are made largely, or solely in some instances, through evaluations of verbal behavior, the ideas, moods, and beliefs expressed by a patient, either vocally or in writing, provide the source of information from which conclusions about personality are drawn. This procedure requires the a priori assumption, sometimes unstated but nevertheless acknowledged, that an individual's speech is representative of his usual behavior or personality.

For this study theoretical support is derived primarily from principles of psychoanalysis. Psychoanalytic orientation assumes that "anxiety" reduction begins soon after birth and continues throughout life. The defensive operations used tend to become idiosyncratic and to persist. Stress arises primarily in interpersonal relationships and, as such, arises in the same environment as that in which speech is used.

Where stress arises defensive operations must be present and, from necessity, exist in speech behavior (Weintraub & Aronson, 1962).

Briefly, then, the thesis for this study is that the verbal behavior of an individual reflects the particular coping mechanisms he has developed to assuage feelings of anxiety.

Pioneering Investigations in Speech Behavior

One of the first scientific investigations in verbal behavior was undertaken by Busemann (1926) when he statistically analyzed the number of verbs and adjectives occurring in children's speech. The verb-adjective quotient (VAQ) correlated positively, and adjectives correlated negatively with ratings of emotional instability for his subjects. Busemann interpreted these findings to mean, essentially, that activity was indicative of instability while qualitative speech construction was indicative of stability.

Until the work of Newman and Mather (1938) little attention was paid to exact speech characteristics associated with specific psychiatric syndromes. These investigators phonographically recorded the speech of patients while they read selections or spoke spontaneously. The patients' speech samples were then checked against measurement categories which included items pertaining to pitch, emphasis, articulatory movements, syntactical factors, tempo, length of response, and resonance. Pathological syndromes of classical depression, states of dissatisfaction and self-pity, and classical mania were clearly differentiated on the basis of the variables observed.

In the conclusion of their study Newman and Mather (1938) stressed

a point, key to this project. They wrote:

> "Except in a purely formal sense, speech is not a self-contained category of behavior. Together with other behavioral forms it provides external symbols of human functioning, and one can therefore expect and find relations between speech and other modes of behavior."

A notable study by Balken and Masserman (1940) presented a method for the objective analysis of phantasy language found in patients with various types of psychoneuroses. Indices found to have individual significance were the verb-adjective quotient (VAQ), pro-con quotient, certainty-uncertainty quotient, and the qualification-certainty quotient. These quotients plus other measurements - the average number of words per phantasy, and the number of active, passive and intransitive verbs - were found to indicate that mental dynamisms of conversion hysteria, anxiety state, and obsessive-compulsive neuroses had particular reflections in phantasy production and could be differentiated by these measures.

A methodical and comprehensive study of language was initiated by Johnson (1944) when he devised the "type-token ratio" (TTR) as part of a research program at the University of Iowa. The TTR is the ratio of the number of different words (types) to the total number of words (tokens) in a given passage. When speech samples of schizophrenics and college students were compared by the TTR, Fairbanks (1944) found that schizophrenics used more self-referent pronouns, more pronouns and verbs, fewer nouns and articles, more negatives and were more preoccupied with the past as judged by verb tense than college students.

Over two decades ago Chapple (1946) reported on a technique developed

to objectively measure and describe "personality" based on time unit analysis of the interaction between an interviewer and an interviewee. Chapple's interaction method is based on the assumption that the time dimension of one's interpersonal actions provides the basis for understanding personality. The standardized interview created by Chapple has five timed periods, each period being either a free or stress interview situation. Periods one, three, and five are free give-and-take periods (primarily non-directive interviewing), period two creates an artificial situation in which the interviewer maintains silence, and period four provides for the interviewer to interrupt each of the interviewee's utterances. Periods two and four are stress periods. The interviewee's speech behavior during these five periods is recorded and analyzed.

In dealing with the problem of the analysis of human speech, one can take two directions. One direction stresses the manifest content (assumed meaning) of the message and relies primarily on face validity. A second direction is more concerned with the structure (form) of the speech and is more readily objectifiable and quantifiable. Of course, with either approach one can emphasize the instrumental function of language and speech. It should be noted that the distinctions of form and content are usually recognized as functional separations and are not individually occurring verbal qualities. Most research on content variables generally has not attempted to deal with structural variables and vice versa. However, some workers have studied both form and content. Research subsequent to the initial studies mentioned above will now be discussed according to these distinctions.

Review of Literature

Verbal content analysis. Relevant to this study is the work of Lorenz and Cobb (1953) which investigated language behavior in psychoneurotic patients using grammar and syntactical measures. Speech samplings (verbal responses to Thematic Apperception Test cards) were obtained from twenty subjects and analyzed. The results were interpreted as showing that the language patterns of neurotic subjects reflected a significant relative increase in the frequency of verbs and pronouns while at the same time showing a significant decrease in the use of substantives, adjectives, prepositions, conjunctions, and articles. A study of similar design (Lorenz & Cobb, 1952) investigating the language pattern of manic patients produced results that paralleled those of the psychoneurotic patients, e.g., use of verbs and pronouns significantly increased as the use of adjectives and prepositions significantly decreased. The VAQ for these groups was significantly higher than that of the control group. In a subsequent study (Lorenz & Cobb, 1954) hysteric and obsessive-compulsive patients were found to use pronouns with significantly greater frequency. The use of "I" was greatly emphasized by both of these groups. Paranoid schizophrenic patients were reported as using pronouns with the same relative frequency as do normals; however, of the pronouns used by the paranoid group the third person "he" occurred most often.

An investigation of the relations between speech behavior and anxiety level (Benton, Hartman, & Sarason, 1955) failed to support the findings of Balken and Masserman (1940) that high-anxious subjects show a faster rate of utterance. Benton and his co-investigators did find

that high-anxious subjects showed greater productivity and shorter latency in speech behavior.

Hypothesizing that the degree of an individual's personal and social disorganization can be quantitatively assessed at any one time from the frequency of occurrence of particular speech habits and themata, a group of investigators at the University of Cincinnati College of Medicine began a program of study to develop a method of assessing relative degree of personal disorganization and social alienation (Gottschalk, Gleser, Daniels, & Block, 1958). A series of three-minute verbal samples was elicited from five male schizophrenic patients over a period of weeks. From these samples an index of the personal disorganization and social alienation of a particular patient at different times was obtained. The speech samples were scored by counting the frequency of occurrence of various content and form categories provided in grammatical clauses and then weighted according to the degree of schizophrenic disorder judged present. An intraindividual adjustment was made. These investigators stated that their verbal analytical method of assessment showed relatively high validity in assessing intra-individual variations in personal disorganization and social alienation (Gottschalk, Gleser, Daniels, & Block, 1958).

In a subsequent study on the speech patterns of schizophrenic patients (Gottschalk, Gleser, Magliocco, & D'Zmura, 1961) - a study analyzing five-minute speech samples and scored for interpersonal references, intrapersonal references, signs of disorganization, questions directed to the interviewer, and religious and biblical references - evidence was provided which showed that the severity of the schizophrenic

illness could be quantitatively assessed. Under their test conditions paucity of speech provided a validated measure of severity of illness.

A more recent study in the Cincinnati series (Gottschalk & Gleser, 1964) reported that the above schizophrenic measures were capable of discriminating speech samples of schizophrenic patients from those of well subjects and medically ill patients. Brain damaged patients obtained scores distributed approximately as those of schizophrenics. However, the category references to interpersonal relationships, and the patients' verbal statements indicating disorientation tended to distinguish between these two groups.

Gottschalk and her co-investigators, besides developing a verbal speech analysis for schizophrenic patients, have developed an anxiety scale applicable to verbal samples (Gleser, Gottschalk, & Springer, 1961). These researchers were interested primarily in measuring "free" anxiety by including only psychological manifestations of anxiety and by omitting autonomic and nonverbal manifestations. From verbal samples discussions of death, mutilation, separation, guilt, shame, and diffuse or nonspecific anxieties were scored. Scores were correlated with the psychasthenia scale (Pt) of the Minnesota Multiphasic Personality Inventory (MMPI), as well as with clinical judgments of the subject's anxiety. Scores for the death, mutilation, and nonspecific anxiety categories were positively correlated, while the shame, separation, and guilt anxiety scores were negatively correlated.

Mabry's (1964) dissertation study compared the language of schizophrenics with that of normal subjects. Her study is unique in that an effort was made to select patients who did not show obviously deviant

language behavior, and a sentence-completion test rather than spontaneous speech was used. Categories of fragmentation, approximation, tautology, interpenetration, overinclusion, autism, crypticism, and perserveration were scored. The results of this study were interpreted as showing that schizophrenics could be distinguished from normals on a gestalt impression basis as well as on the language categories scored.

Verbal structure analysis. As mentioned above vocal communication can be viewed as two operations: an operation of content communication and a simultaneous operation of communicating by structure. Soskin (1953) presented these operations another way when he spoke of vocal communication as consisting of 'semantic information' (content) and 'affective information' (form). In his view there are two communication channels. One channel - content - is superimposed upon the second channel and carrier - voice quality. Voice quality supposedly lacks strict conscious control and may contain information at variance with the message content.

Goldman-Eisler, a British psychologist working at Maudsley Hospital in London, has investigated various features of motor expression, some of which are mentioned below. Using as subjects seven members of the Psychology Department she (Goldman-Eisler, 1951) showed that each subject, in free conversation, had rather stable idiosyncratic interaction patterns - the specific variables investigated were short and long silences and short and long actions. The silence variable was shown to be a more stable characteristic of personality than action.

A subsequent study (Goldman-Eisler, 1952) investigating individual differences between interviewers and their interaction effects on patient-interviewees showed that each interviewer regardless of the

type of patient being interviewed had his own individual interaction pattern. Also, and of more practical interest, is the report that each interviewer influenced the interaction pattern of the patients in different ways. Goldman-Eisler noted that the depressed patient responded better to active stimulation while the free and easy speaking patient responded best to a passive interview technique. In subsequent studies she found speech rate, rate of respiration, and number of syllables spoken per respiration were consistent and sensitive measures in showing interindividual differences (Goldman-Eisler, 1954, 1955) and that pauses and pause lengths were related to the information content of the words following the pauses (Goldman-Eisler, 1958).

Investigating the role of structural variables in speech Maclay and Osgood (1959) analyzed samples of speech of thirteen male speakers, all professionals speaking at a conference at the University of Illinois. Hesitation variables studied were: false starts, repeats, filled pauses, and unfulfilled pauses. Results supported previous findings that there are large individual differences in speech hesitation phenomena. An unusually high intraindividual reliability for these variables was reported.

Matarazzo, Hess, and Saslow (1962) in an attempt to understand the frequency and duration characteristics of speech and silence in interviewees analyzed single units of speech of one interviewer and twenty interviewees. The results of their investigation indicate that both speech and silence behavior is composed of units of short duration and fewer units of long duration; in other words, the distribution is J-shaped.

In a following study (Matarazzo, Weitman, Saslow, and Wiens, 1963) duration of the interviewer's speech was systematically varied in order

to study its direct effects on the duration of the interviewee's speech. Results of the statistical analyses were not given, but these investigators did report that as the interviewer increased his single units of speech the subject similarly increased his duration of response, and as the interviewer decreased his ten-second utterances to five seconds, the subject made comparable changes.

An investigation by Dinoff, Morris, and Hannon (1963) of the stability of schizophrenic speech using the partially standardized Chapple interview technique found results consistent with those of the Matarazzo, et al. (1963) study. In Dinoff's study a partially standardized interview alternating stress and stress-free periods was administered to ten chronic schizophrenic patients. A few days later the interview was readministered. Their data were consistent; stability and high reliability for the interaction measures were found.

Using a similar procedure of alternating stress and stress-free periods of interviewing with regressed schizophrenics, nonmedicated schizophrenics, and normals, Dinoff, Hannon, Patterson, and Morris (1967) reported that at least for the three nosological groups studied the interview technique was diagnostically discriminable. Some of the variables were total time, absolute silence, experimenter's required initiations, subject's actions, and so forth. Of thirty-one variables, there was a significant difference among groups at a five per cent level of confidence or better on twenty-seven measures.

Results of a study on the speaking fundamental frequency and rate characteristics of adult female schizophrenics (Saxman & Burk, 1968) indicated that overall and sentence oral reading rates for schizophrenic

women were slower than for normal women. These results were consistent with the performances of male schizophrenics when compared to normals (Burk & Saxman, 1965). Additionally, in the male schizophrenic group less pause time between sentences was reported.

Studies investigating both verbal content and structure. Not all researchers make a distinction between content and form when inquiring into characteristics of verbal behavior. Indeed, this investigator selected measures which taken as a whole reflect an amalgamation of both speech qualities. The selection of specific measures is contingent upon the hypotheses a particular experimenter wishes to study. Reports of research described below include measures of both form and content.

An attempt to measure transient anxiety by standardizing measurements of clinical "cues" resulted in the development of numerous speech indices (Dibner, 1956). Speech samples of thirty-nine hospitalized patients with a diagnosis of either psychoneuroses, character disorder, or psychosomatic reaction were tape recorded and scored on eleven speech characteristics: unfinished sentence, breaking in with a new thought, interrupted sentence, repeating words, stuttering, statements of "I don't know", sighing, laughing, voice change, questioning the interviewer, and blocking. Two measures of situational anxiety were revealed by analysis: cues related to speech disruption and cues related to nonverbal voice characteristics.

Investigating the hypothesis that the most valid linguistic measures of anxiety were based on expressive aspects of speech Mahl (1956) examined disturbances and silences in patients' speech while in psychotherapy sessions. From indices somewhat similar to those indices of Dibner (1956)

and from scored verbal samples he formulated the Speech-Disturbance Ratio (SDR) and the Silence Quotient. The SDR is the number of speech disturbances scored for a patient divided by the number of words spoken. The Patient-Silence Quotient is the number of seconds of silence divided by the number of seconds available to the patient for talking. Both of these measures were reported to be reliable and discriminating measures of anxiety.

In an examination of verbal behavior and emotional adjustment Kanfer (1959) obtained two-minute speech samples from twenty college students. The speech samples were replies to questions relating to family, self-confidence, achievement, sexual attitudes, and emotional maturity. Verbal rate and content were measured. Kanfer found that particular topics showed differential effects on the verbal rate of subjects and, additionally, that subjects talked significantly faster on those topics on which their adjustment was rated poorest. These findings were related to a general hypothesis that anxiety facilitated verbal rate.

A replication of the Mahl study cited above was performed by Boomer and Goodrich (1961). Specifically, Mahl had hypothesized that the SDR varied directly with fluctuations in the speaker's anxiety level. Mahl's findings were that the SDR was significantly higher for those phases he considered "low anxious". Boomer and Goodrich interpreted the results of the replicated study as being inconclusive. The sections of the subject's speech judged "more anxious" showed no higher SDR than those sections judged "less anxious".

A study offering a possible reconciliation for the above is the report of Krause (1961). Eight purported measures of anxiety were applied to ten-minute recorded speech samples of fifteen hospitalized mental

patients. The measures were: number of words spoken, latency of the response, number of references to the interviewer, number of verbs and adjectives, number of speech disruptions, and the rate of speech. An intercorrelation matrix was computed in order to study the amount of individual differences. Information from the intercorrelation matrix supported the view that different measures may be valid for different persons and that the measurement values indicating anxiety or nonanxiety may also be idiosyncratic.

A study by Krause and Pilisuk (1961) was designed to use the measures of Mahl (1956) and Dibner (1956) in conjunction with an objective anxiety criterion. Nineteen subjects were exposed to ten stressors and ten non-stressors. The combination of stressor and reported feelings of anxiety served as the criterion of anxiety's presence. Their findings supported the view that of the measurements used intrusive nonverbal sounds, primarily laughs and sighs, are the most correct predictors of anxiety.

The effects of level of mental health, premorbid history and interpersonal stress in chronic schizophrenics on speech disruption were investigated by Blumenthal (1964). Forty-eight hospitalized patients with good or poor premorbid life histories and with regressed or partially remitted levels of mental health were exposed to a neutral interview and two stress interviews. Speech disruption scores were obtained from tape recordings of these interviews. The results obtained by Blumenthal made possible a number of observations. A difference in responsibity of regressed and poor premorbid subjects was noted. This finding suggested that there may be different psychological processes

underlying these two particular classifications of schizophrenia. It was hypothesized that regressed schizophrenics experienced extremely high levels of anxiety since disruption was present in several areas of their behavior. Shifts to less supportive interpersonal relations resulted in sharp increases in speech disruption. On the basis of the above findings Blumenthal hypothesized that premorbid subjects with poor life histories were prone to develop an exaggerated dependency on supportive interpersonal relationships.

Of the twelve measures chosen for use in this thesis investigation ten were selected from the study by Weintraub and Aronson (1962). The several investigations of Weintraub and Aronson (1962, 1964, 1965, 1967, 1969) have as their basis the assumptions that everyone at all times uses defensive or adjustive mechanisms and that certain defensive mechanisms are used by specific pathological groups. They also argue that it is justifiable to speak only of the type of mechanism used rather than of the amount of defensiveness shown. They further believe that severe psychopathology reflects, in place of too much or too little defensiveness, types of defenses lacking sufficient flexibility and subtlety to achieve comfortable functioning in life (Weintraub & Aronson, 1962).

Twelve categories, each objectively scorable, were selected from the many verbal categories available. From these twelve categories, nine were related to specific defense mechanisms (Weintraub & Aronson, 1962). The first of these categories, Nonpersonal References, is considered a measurement of defensive avoidance by certain patients who do not choose to make references to themselves or to people close to them. A low score

in this category is considered a reflection of the degree of self-preoccupation. The category of Negators, or negatives, may be thought of as relating to defensive operations of "negation" or "denial". Time References may be considered a measure of what has been termed "temporal regression" in psychoanalytical literature (Glover, 1955). What psychoanalysts refer to as "undoing before the fact", or more simply as "undoing", Weintraub and Aronson subsume under the measures of Qualifiers and Retractors. Since these two categories appear to measure similar defensive operations the present investigator has incorporated the two measures into one - Retractors - and has broadened the operational definition of that category. The category Explaining is considered by Weintraub and Aronson to be a rough measure of the tendency of a person to rationalize. Certain patients while in the interviewer's office become defensively preoccupied with thoughts about the interviewer or the immediate surroundings and attempt to manipulate the interviewer into removing the cause of his discomfort. As a measure of this defensive operation the category Direct References is used. The category Expressions of Feeling is included not because expressions of feeling have been shown to be related to a tangible defensive operation, but rather because as a measure, Expressions of Feeling appears to be idiosyncratic and, of course, it is probably a measure of <u>something</u>. The amount of affect a person can overtly express may be the quality being measured by Expressions of Feeling, but at this point it is uncertain. The category Evaluators may be considered to be, in a broad sense, a measure of the defensive use of opinions and judgments as an alternative to the expression of sincere feelings. Krause and Pilisuk (1961) found that intrusive nonverbal sounds were significantly correct predictors for

the presence of transitory anxiety. In order to have a general estimate of each subject's concurrent anxiety the category Intrusions is included in the present investigation.

Results of an intercorrelational analysis on Weintraub and Aronson's original twelve categories showed that: Quantity of Speech correlated positively with Rate of Speech and negatively with Long Pauses and Silences, Expressions of Feeling correlated negatively with both Nonpersonal References and Amount of Speech, Direct References correlated negatively with Amount of Speech and Rate of Speech and positively with Silences and Retractors, Negators correlated positively with Quantity of Speech and negatively with Long Pauses and Silences, Retractors correlated positively with Quantity of Speech, Negators and Retractors were also positively intercorrelated, Qualifiers correlated positively with Evaluators, Retractors correlated positively with Qualifiers, Explaining correlated positively with Rate of Speech, and Quantity of Speech correlated positively with Shift to Past Tense (Weintraub & Aronson, 1962). The above measures are described in the Method section.

The first of their series of studies designed to relate speech behavior to clinically meaningful nonverbal behavior investigated the speech pattern of impulsive individuals (Weintraub & Aronson, 1964). A group of seventeen hospitalized patients having a history of extreme impulsive behavior provided speech samples which were scored on the measures previously mentioned. Retractors, Direct References, Negators, Expressions of Feeling and Evaluators were scored higher for impulsives than for normals. Results were supportive of their initial hypothesis that this group of patients would yield more appeals to the experimenter

for help - i.e., Direct References - and would have a tendency to undo their acts - i.e. Retractors. These authors also provided a scheme showing that overt behaviors were related to certain verbal measures: specifically, intolerable feelings of anxiety increased the measure Feelings, the mechanism of denial increased Negators, manipulation of human environment increased Direct References, guilt increased Evaluators and undoing increased Retractors.

Eichler (1965) applied the verbal behavior analysis procedure to speech samples of sociopathic individuals. Subjects were twenty-five inmates of an institution for delinquents. The results of this study showed that sociopaths when compared to normals scored significantly higher on negation, qualification, retraction, and evaluations. Elevated scores in these categories were interpreted as reflecting the mental defense mechanisms of denial and undoing and the presence of feelings of guilt.

An investigation of the speech behavior of delusional subjects, manifesting primarily delusions of a paranoid nature, (Weintraub & Aronson, 1965) showed these subjects negated, qualified, explained, evaluated significantly more and made more direct references than did normal control subjects. The implied psychodynamics were those of denial, guilt, rationalization, and projection which produced in turn high negators, evaluators, explaining, and direct reference scores.

A study of speech patterns associated with depressive behavior resulted in significant score differences between normal subjects and depressed patients on all but three measures (Weintraub & Aronson, 1967). Nonsignificant measures were qualification, retraction, and explaining.

A summary of the depressed patients' speech behavior reported they used fewer words, talked at a slower rate, had longer silence times. made fewer nonpersonal references, scored higher on negation, feeling and evaluation, and made frequently more statements, $p < .01$, relating to the experimental situation. A diagrammatical scheme related the defense mechanisms involved to particular measures, e.g., intolerable sadness to feeling, denial of loss to Negators, narcissistic regression to retarded speech, rage to feeling, guilt to Evaluators, and attempts to gain reassurance to Direct References.

The speech behavior of eighteen overweight women was analyzed with the results that the obese women used significantly fewer Nonpersonal References, and significantly more Negators, Expressions of Feeling and Retractors than did a normal female group (Weintraub & Aronson, 1969). The investigators related these findings to the dynamics of denial, self-preoccupation, and the defense of undoing.

This concludes a review of the research most relevant to the present study. Findings are generally compatible with and support the view that psychological traits have a characteristic behavioral type. But I do not wish to imply the opinion that any speech trait is absolutely specific for a psychiatric group.

Purpose and hypotheses. The purpose of this study was to determine to what extent paranoid schizophrenics, schizophrenics lacking dominant paranoid traits, alcoholics, and normal subjects differ in their use of particular language characteristics.

Some general predictions of differences in verbal behavior patterns between the groups being measured and normals were suggested by previous

research and psychoanalytic theory. Psychoanalytic theory strongly emphasizes the presence and use of denial and projection mechanisms in paranoid psychotic individuals (Freud, 1911). The thought process of denial occurs, according to Anna Freud (1946), as a reaction to external danger. In addition to the defense mechanisms of projection and denial, Rapaport (1951) observes that as a rule paranoid individuals belong to the intellectualizing nosological groups and use the intellectual defense of rationalization. The presence of a harsh punishing super-ego concerned with what is good or bad, right or wrong exists in the paranoid individual, according to Sullivan (1956). Therefore on the basis of psychoanalytic theory the following predictions were made:

(a) Paranoid schizophrenics score higher in their use of Negators than do normals;

(b) Paranoid schizophrenics, due to their use of projection, use more Direct References than do normals;

(c) Paranoid schizophrenics, due to their use of the mechanism of rationalization, score higher on Explaining than do normals;

(d) Paranoid schizophrenics, serving a harsh and punishing super-ego, score higher on the Evaluator measure than do normals; and, finally,

(e) on the measures mentioned above (a - d), higher scores are earned in the unstructured condition (subject chooses speech topic) than in the structured condition.

Psychoanalytic treatment of the personality dynamics of the alcoholic individual is somewhat difficult to formulate, for two reasons: first,

alcoholics are not a homogenous group - witness the 'species' of alcoholism considered by Jellinek (1960); alpha, beta, gamma, delta, and epsilon alcoholisms - and secondly, the study of alcoholic individuals "is difficult because chronic use of alcohol 'masks' what may be underlying traits (Blum & Blum, 1967)". The classic psychoanalytic theory of alcoholism suggests that a " ... person with oral fixations is confronted with a difficult situation in life [one consisting of a threat to oral-dependent gratification]. The attempt is then made to alleviate the anxiety created by this situation [threat] by drinking (Higgins, 1953)". Higgins points out that the "difficult situation" may or may not be one having as its primary component an "oral threat". Thus, drinking and intoxication become kinds of defense mechanisms against various sources of anxiety. According to this theory anxiety should be present in the alcoholic when he is not drinking or intoxicated.

M. C. Jones (1962) in her review of previous psychodynamic studies of the alcoholic characterizes that individual as follows: restless, angry, insecure, depressed, conflicted, anxious, deeply guilt ridden, lacking in self-esteem and self-assertion, emotionally unstable, with low frustration tolerance, and high but unfulfilled aspirations. Many of these traits are present in others than alcoholics. Weintraub and Aronson (1964, 1967, 1969) have consistently reported similarities in the psychodynamic constellations of 'oral' groups as reflected by their speech patterns. The particular groups these investigators studied were overeaters, depressives, and impulsives. Conflict, preoccupation with personal problems, low frustration tolerance, anxiety, etc., were reported frequently present in individuals of these groups. With these characteristics in mind some predictions were made:

(a) Alcoholics score higher on Intrusions, a scale roughly measuring anxiety, than do normals;

(b) Alcoholics score lower on Nonpersonal References, a scale measuring on the lower end of the continuum the degree of self-preoccupation, than do normals;

(c) Alcoholics score higher on Expressions of Feeling, a scale having an inverse correlation with Nonpersonal References, than do normals;

(d) Alcoholics score higher on Retractors, a scale related to the defense of undoing and a rough measure of impulsivity, than do normals; and finally,

(e) the magnitude of these scores is greater in the predicted direction for the unstructured condition then for the structured condition.

Dependency needs, anxiety, and a temporal bond with the immediate or present broadly characterize the personality features of schizophrenic patients (Searles, 1955). According to Searles dependency needs are anxiety-provoking primarily because they invoke a feeling that the other person is frighteningly important and indispensable to the patient's survival. The patient has anxiety lest his dependency needs lead him to lose his identity. Rosenfeld (1950), noting the presence of intense anxiety in schizophrenic patients, states that

> "The confusional state is associated with extreme anxiety, because when libidinal and destructive impulses become confused the destructive impulses seem to threaten to destroy the libidinal impulses. Consequently, the whole self is in danger of being destroyed."

It has been said that the schizophrenic is imprisoned in the present (Searles, 1955). He is so afraid of changes and of memories associated with the present that he attaches himself to what is immediate. He may become in this sense a prisoner to immediate experience.

The role of the super-ego in schizophreniz is discussed in another paper by Searles (1961). The super-ego is seen as an archaic, harsh and forbidding control which serves as a basic factor in helping to account for the schizphrenic's heavily disguised and fragmentary verbal communications.

These clinical opinions, then, provide a possible base from which certain predictions of schizophrenic speech patterns were made:

(a) Schizophrenics score higher on Intrusions, a scale roughly measuring anxiety, than do normals;

(b) Schizophrenics score lower in their use of the past tense on Time References than do normals;

(c) Schizophrenics, serving a harsh and forbidding super-ego, score higher on Evaluators than do normals; and lastly,

(d) the magnitude of these scores is greater for the unstructured condition than for the structured condition.

The above concluded the investigator's a priori hypothesis. Generally, it was predicted that differences in speech behavior would be found for each group as well as between the sexes.

METHOD

Selection of subjects. Population categories for this study were selected on the basis of subject availability and the researcher's desire to obtain language samples which would reflect sufficiently different speech behaviors as to make possible some indication of the sensitivity of the measures to be employed. The clinical sample studied consisted of inpatients at Eastern State Hospital. Three groups of patients were selected for study: one group consisted of individuals diagnosed as paranoid schizophrenic, another group consisted of individuals diagnosed as having schizophrenia but who lacked manifestations of the paranoid quality of the first group, and the third patient group consisted of individuals diagnosed as alcoholics. The normals or controls, consisting of individuals without a history of mental illness, formed the fourth and last group. Twenty subjects composed each group: of each group ten subjects were male; ten, female. Speech measures for males and females were analyzed independently. These four groups provided a total population of eighty subjects.

Criteria for all subjects were that they be Caucasian, between approximately twenty-one and fifty-five years of age, have at least six years of education, and have a medical history lacking indications of organicity or brain disease. Further, all subjects were to be volunteer subjects. Hospital employees, male and female aides and attendants, who met these criteria and who were volunteers were selected as control subjects.

Individuals composing the schizophrenic groups met two additional criteria: a diagnosis of schizophrenia, paranoid type; or a diagnosis of schizophrenia lacking paranoid manifestations and, additionally, a score falling in the process range of the Ullman and Giovannoni Self-Report Index, a process-reactive scale for schizophrenics. (Appendix A contains a copy of the Ullman and Giovannoni Self-Report Index.) This last criterion reflects an effort to control for what may be etiologically and developmentally dissimilar schizophrenias.

Selection of measures. Selection of the speech measures was based on criteria established by Weintraub and Aronson (1962). They isolated twelve categories which met the following criteria: the measures (1) could be objectively scored with adequate interjudge reliability, (2) appeared to be related to psychological defense mechanisms, (3) were idiosyncratic - that is, used by different individuals to significantly different degrees, and (4) were largely dependent upon formal characteristics of speech in the sense that the measures could be scored lacking knowledge of the associative meaning of the verbal samples (Weintraub & Aronson, 1964).

Types of measures. Following is a report of the twelve categories used with descriptions of their scoring procedures:

(1) Quantity of Speech (QS): The score for this category is calculated simply by counting all spoken words. Words must be complete and sounds are not scored.

(2) Silence Time (ST): Silence Time consists of pauses or silences of any interval. A final "silence" score is arrived at by adding the individual's number of seconds

paused.

(3) Rate of Speech (RS): Rate of Speech is calculated by totaling the number of words spoken and dividing that number by the minutes of speech. Silence Time is subtracted from the total time allotted for speech and this provides the minutes of speech.

(4) Nonpersonal References (NR): All clauses are divided into "personal" and "nonpersonal". A "personal" clause is one whose subject refers to individuals possibly known to the speaker, including the speaker himself. All clauses not scored as "personal" are placed in the "nonpersonal" category. The total number of "nonpersonal" clauses is divided by the number of scored clauses. This derived number is multiplied by 1000.

(5) Negators (N): All negatives are scored. This includes "not", "no", "nothing", "never", etc.

(6) Time Reference (TR): When one uses a verb or verb phrase he refers to the present, past, or future. Time Reference is determined by counting the verbs or verb phrases in which the speaker refers to the past.

(7) Intrusions (I): An "intrusion" is a nonverbal sound which intrudes upon the flow of speech where it occurs meaningfully as a break. It may be a sigh, a laugh, cough, throat clearing, or a deep breath.

(8) Retractors (R): A "retractor" is defined as any word, phrase, or clause which in any degree detracts from the statement immediately preceding it. This includes the

use of words or phrases indicating uncertainty or serving to detract from the forcefulness of the statement.

(9) Explaining (Ex): Explaining is scored when a subject indicates by a word, phrase, or clause a causal relationship, a reason for an action, or a justification for an action or thought.

(10) Direct References (DR): Direct References is scored when the subject makes reference to: (a) the experimenter, (b) the procedure, (c) the physical surroundings, or (d) addresses questions to the experimenter. Any verbal attempt to manipulate the interviewer into removing the cause of the subject's discomfort would be scored in this category.

(11) Expressions of Feeling (ExF): For Expressions of Feeling, all qualities in which the speaker describes himself as experiencing or having experienced some feeling are scored. Generally counted are attraction-aversion, like-dislike, satisfaction-dissatisfaction, pleasure-displeasure, hope, fear, enjoyment, and so forth.

(12) Evaluators (Ev): All value judgments are scored. Value judgments include goodness and badness, usefulness and uselessness, propriety and impropriety, and pleasantness and unpleasantness.

This completes the list of measures used in this study. The measure Time Reference was borrowed from Cope (1969). The measure Intrusions was borrowed from Krause and Pilisuk (1961). All other measures were

borrowed from Weintraub and Aronson (1962). Quantity of Speech, Silence Time, and Rate of Speech do not have adjusted scores. In order to make comparisons between subjects who use quantitatively different amounts of language during the four minutes of scored verbal behavior the remaining nine measures had a conversion factor: the adjusted score equalled the actual score multiplied by one thousand divided by the number of words spoken (Weintraub & Aronson, 1964), that is,

$$\text{Adjusted score} = \text{Actual score} \times \frac{1000}{\#\ \text{words}} .$$

Method of data collection. Two four-minute speech samples were collected from each subject. Verbal material was collected in the following way: the experimenter placed before the subject a microphone visibly attached to a tape recorder and, for one of the four-minute recordings, asked the subject to talk on any topic or topics he chose. The experimenter instructed each subject thusly:

Unstructured condition:

Mr(s). _____ I would like you to talk for four minutes on any subject or subjects you choose. I will not answer any questions during this time but will signal when the four minutes is up. The tape recorder you see on the desk is going. Start when you are ready. (four minutes) Stop, please.

Structured condition:

I would like you to look at this picture, make up a story about it, and tell me the story, taking at least four minutes. I will signal when the time is up. (four minutes) Stop, please.

Since there were two four-minute sequences of verbal data collection, the order of presenting the instructions was reversed for half of the

subjects in each group in order to minimize any administrative positional effects. Half of the subjects in each group were administered the story-telling condition first. Following these procedures each subject's speech was transcribed verbatim from the tape and scored. Appendix B contains a copy of the verbal behavior analysis score sheet used in this study. Randomly selected speech samples were scored by two scorers trained in the Weintraub and Aronson scoring method in order to obtain an estimate of interscorer reliability.

RESULTS

The twelve verbal behavior scales were analyzed independently in accordance with computational procedures for a type Split-Plot Factorial Design (SPF - pr.q) analysis of variance (Kirk, 1968). Treatments for each scale were sex (male, female), speech condition (unstructured, structured), and subject groups (controls, paranoid schizophrenics, alcoholics, and schizophrenics other than paranoid). A t-test for multiple mean comparison (Bruning and Kintz, 1968) set at α.05 level of significance was used to find differences among several means in each instance that an F-ratio was found to be statistically significant at $p < .05$ for more than two conditions of a treatment or for multiple treatments.

Means and ranges for age, education, and length of hospitalization for each group of subjects are presented in Appendix C.

An estimate of interscorer reliability between judges trained in similar scoring methods was obtained by computing the Kendall Rank-Order Correlation (tau) for four speech periods for the following scales: Evaluation, Expression of Feeling, Explanation, Retraction, Direct References, Negation, Intrusion, Time Reference, Nonpersonal Reference, and Quantity of Speech. A tau of +.99 was found for the rank-order correlated scale scores in the unstructured speech condition. A tau of +.945 was found for the scale scores in the structured speech condition.

Group mean scores and statistical data for the verbal behavior scales

are presented sequentially in tables 1(a) - 12 (b).

For the Paranoid Schizophrenic group four categories were chosen for hypothesis: Negators, Direct References, Explaining, and Evaluators. Table 13 presents the predictions and the findings for this group.

For the Alcoholic group four categories were chosen for hypothesis: Intrusions, Nonpersonal References, Expressions of Feeling, and Retractors. Predictions concerning these measures and the experimental results are reported in Table 14.

For the Schizophrenic group three categories were chosen for hypothesis: Intrusions, Time References, and Evaluators. Table 15 reflects the predictions and experimental results.

TABLE 1 (a)

QUANTITY OF SPEECH
(Total number of words spoken)

Groups	Unstructured*			Structured		
	M	F	$\bar{X}\xi$	M	F	$\bar{X}\xi$
Normal	424.8	428.9	426.8	265.6	303.4	284.5
Paranoid schizophrenic	347.6	345.5	346.5	246.8	250.4	248.6
Alcoholic	535.4	367.3	451.3	220.7	217.7	219.2
Schizophrenic	310.6	338.9	324.7	158.2	185.4	171.8

* Speech conditions were significant at $p < .001$

TABLE 1(b)

ANALYSIS OF VARIANCE:

QUANTITY OF SPEECH

Source	dF	MS	F
Sex (A)	1	3258.02	.06
Groups (C)	3	89157.69	1.89
A x C	3	27341.76	.58
Speech Conditions (B)	1	977812.90	69.06#
A x B	1	25857.22	1.82
B x C	3	31212.54	2.20
A x B x C	3	15070.42	1.06
Within Groups	72	14157.69	

# $p < .001$

TABLE 2(a)

SILENCE TIME
(Total number of seconds of silence)

Groups**	Unstructured*			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	81.1	78.7	79.9	133.8	122.8	128.3
Paranoid schizophrenic	112.9	110.0	111.4	138.7	134.5	136.6
Alcoholic	84.6	99.5	92.0	168.1	161.5	164.8
Schizophrenic	129.3	114.6	121.9	173.3	174.0	173.6

* Speech conditions were significant at $p < .001$.

** Speech conditions and groups interacted at $p < .05$. See Table 2(c).

TABLE 2(b)

ANALYSIS OF VARIANCE:

SILENCE TIME

Source	dF	MS	F
Sex (A)	1	429.03	.07
Groups (C)	3	12861.34	2.17
A x C	3	269.38	.05
Speech Conditions (B)	1	98010.00	83.63#
A x B	1	159.99	.14
B x C	3	3798.45	3.24*
A x B x C	3	592.55	.51
Within Groups	72	1171.88	

# $p < .001$

* $p < .05$

TABLE 2(c)

t-TEST MULTIPLE MEAN COMPARISON:

SILENCE TIME

BC	11	12	13	14	21	22	23	24
11		31.55	12.15	42.05	48.40	56.70*	84.90*	93.75*
12			19.40	10.50	16.85	25.15	53.35*	62.20*
13				29.90	36.25	44.55	72.72*	81.60*
14					6.35	14.65	42.85	51.70*
21						8.30	36.50	45.35
22							28.20	37.05
23								8.85
24								

* α .05

TABLE 3(a)

RATE OF SPEECH
(Words per minute)

Groups	Unstructured			Structured		
	M*	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	160.6	164.7	162.6	142.6	157.2	149.9
Paranoid schizophrenic	167.2	158.6	162.9	161.6	140.9	151.2
Alcoholic	212.7	154.1	183.4	186.7	150.5	168.6
Schizophrenic	162.7	165.7	164.2	157.6	166.9	162.2

* Sex and groups interacted at $p < .05$. See Table 3(c).

TABLE 3(b)

ANALYSIS OF VARIANCE:

RATE OF SPEECH

Source	dF	MS	F
Sex (A)	1	5417.25	3.14
Groups (C)	3	3323.98	1.92
A x C	3	6816.34	3.95*
Speech Conditions (B)	1	233.30	.35
A x B	1	459.00	.69
B x C	3	325.99	.49
A x B x C	3	512.08	.77
Within Groups	72	664.16	

* $p < .05$

TABLE 3(c)

t-TEST MULTIPLE MEAN COMPARISON:

RATE OF SPEECH

AC	11	12	13	14	21	22	23	24
11		12.80	48.10*	8.55	9.35	1.85	.70	14.70
12			35.30*	4.25	3.45	14.65	12.10	1.90
13				39.55*	38.75*	49.95*	47.90*	33.40*
14					.80	10.40	7.85	6.15
21						11.20	8.65	5.35
22							2.55	16.55
23								14.00
24								

* α .05

TABLE 4(a)

NONPERSONAL REFERENCES

Groups**	Unstructured*			Structured		
	M	F	$\bar{X}\xi$	M	F	$\bar{X}\Sigma$
Normal	386.0	426.9	406.4	734.4	803.0	768.7
Paranoid schizophrenic	415.0	360.2	387.6	738.6	729.7	734.1
Alcoholic	337.2	251.9	294.5	599.3	601.4	600.3
Schizophrenic	320.0	310.9	315.4	689.1	714.6	701.8

* Speech conditions were significant at $p < .001$.

** Groups were significant at $p < .025$. See Table 4(c).

TABLE 4(b)

ANALYSIS OF VARIANCE:

NONPERSONAL REFERENCES

Source	dF	MS	F
Sex (A)	1	275.63	.00
Groups (C)	3	153050.60	3.41+
A x C	3	19274.07	.43
Speech Conditions (B)	1	4907002.50	97.24#
A x B	1	23912.09	.47
B x C	3	19438.41	.38
A x B x C	3	21226.06	.42
Within Groups	72	50458.75	

+ $p < .025$

\# $p < .001$

TABLE 4(c)

t-TEST MULTIPLE MEAN COMPARISON:

NONPERSONAL REFERENCES

C	1	2	3	4
1		26.70	140.12*	78.92
2			113.42*	52.22
3				61.20
4				

* α .05

TABLE 5(a)

NEGATORS

Groups***	Unstructured*			Structured		
	M**	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	15.1	16.1	15.6	33.1	28.1	30.6
Paranoid schizophrenic	25.1	26.6	25.8	28.8	21.2	25.0
Alcoholic	22.4	35.0	28.7	33.9	46.3	40.1
Schizophrenic	21.7	23.0	22.3	21.0	35.7	28.3

* Speech conditions were significant at $p < .05$.

** Sex was significant at $p < .001$.

*** At $p < .05$ significant interaction occurred between sex, speech conditions, and groups. See Table 5(c).

TABLE 5(b)

ANALYSIS OF VARIANCE:

NEGATORS

Source	dF	MS	F
Sex (A)	1	167786.27	174.42#
Groups (C)	3	1002.05	1.04
A x C	3	55150.24	57.33#
Speech Conditions (B)	1	2488.51	4.13*
A x B	1	167187.27	277.48#
B x C	3	476.10	.79
A x B x C	3	55977.92	92.90#
Within Groups	72	602.52	

# $p < .001$

* $p < .05$

TABLE 5(c)

t-TEST MULTIPLE MEAN COMPARISON:

NEGATORS

ABC	111	121	112	122	113	123	114	124	211	221	212	222	213	223	214	224
111		18.0	10.0	13.7	7.3	18.8	6.6	5.9	1.0	13.0	11.5	6.1	19.9	31.2	7.9	20.6
121			8.0	4.3	10.7	.8	11.4	12.1	17.0	5.0	6.5	11.9	1.9	13.2	10.1	2.6
112				3.7	2.7	8.8	3.4	4.1	9.0	3.0	1.5	3.9	9.9	21.2	2.1	10.6
122					6.4	5.1	7.1	7.8	12.7	.7	2.2	7.6	6.2	17.5	5.8	6.9
113						11.5	.7	1.4	6.3	5.7	4.2	1.2	12.6	23.9	.6	13.3
123							12.2	12.9	17.8	5.8	7.3	12.7	1.1	12.4	10.9	1.8
114								.7	5.6	6.4	4.9	.5	13.3	24.6	1.3	14.0
124									4.9	7.1	5.6	.2	14.0	25.3	2.0	14.7
211										12.0	10.5	5.1	18.9	30.2*	6.9	19.6
221											1.5	6.9	6.9	18.2	5.1	7.6
212												5.4	8.4	19.7	3.6	9.1
222													13.8	25.1	1.8	14.5
213														11.3	12.0	.7
223															23.3	10.6
214																12.7
224																

* α .05

TABLE 6(a)

TIME REFERENCES

Groups	Unstructured*			Structured		
	M**	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	26.1	49.1	37.6	6.2	8.5	7.3
Paranoid schizophrenic	28.5	39.2	33.8	17.9	38.0	27.9
Alcoholic	54.7	49.5	52.1	11.3	6.7	9.0
Schizophrenic	27.2	65.4	46.3	17.5	4.5	11.0

* Speech conditions were significant at $p < .001$.

** Sex was significant at $p < .025$.

TABLE 6(b)

ANALYSIS OF VARIANCE:

TIME REFERENCE (PAST TENSE)

Source	dF	MS	F
Sex (A)	1	3756.87	5.68+
Groups (C)	3	797.96	1.20
A x C	3	678.79	1.02
Speech Conditions (B)	1	33415.56	55.00#
A x B	1	1834.46	3.01
B x C	3	2382.27	3.92
A x B x C	3	2003.01	3.29
Within Groups	72	607.46	

# $p < .001$

+ $p < .025$

TABLE 7(a)

INTRUSIONS

Groups	Unstructured			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	10.4	15.0	12.7	9.2	15.9	12.6
Paranoid schizophrenic	8.2	8.9	8.5	12.9	6.1	9.5
Alcoholic	6.4	26.8	16.6	15.9	24.8	20.3
Schizophrenic	10.1	13.6	11.8	34.1	16.4	25.3

TABLE 7(b)

ANALYSIS OF VARIANCE:

INTRUSIONS

Source	dF	MS	F
Sex (A)	1	258.57	.39
Groups (C)	3	874.54	1.34
A x C	3	934.79	1.43
Speech Conditions (B)	1	816.31	1.70
A x B	1	911.07	1.90
B x C	3	380.66	.79
A x B x C	3	234.30	.48
Within Groups	72	479.18	

TABLE 8(a)

RETRACTORS

Groups**	Unstructured*			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	16.6	12.9	14.7	50.6	55.3	52.9
Paranoid schizophrenic	16.3	17.0	16.6	37.7	23.7	30.6
Alcoholic	25.2	29.3	27.3	59.1	43.3	51.2
Schizophrenic	16.0	16.7	16.3	42.3	52.4	47.3

* Speech conditions were significant at $p < .001$.

** Groups were significant at $p < .05$. See Table 8(c).

TABLE 8(b)

ANALYSIS OF VARIANCE:

RETRACTORS

Source	dF	MS	F
Sex (A)	1	154.40	.26
Groups (C)	3	1683.55	2.89*
A x C	3	307.15	.52
Speech Conditions (B)	1	28723.71	46.62#
A x B	1	136.25	.22
B x C	3	1051.92	1.70
A x B x C	3	598.99	.97
Within Groups	72	616.04	

# $p < .001$

* $p < .05$

TABLE 8(c)

t-TEST MULTIPLE MEAN COMPARISON:

RETRACTORS

C	1	2	3	4
1		10.2	5.37	2.01
2			15.57*	8.19
3				7.38
4				

* α .05

TABLE 9(a)

EXPLAINING

Groups**	Unstructured*			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	6.8	13.0	9.9	5.0	7.6	6.3
Paranoid schizophrenic	4.7	6.4	5.5	5.1	3.7	4.4
Alcoholic	8.0	6.9	7.4	2.6	4.0	3.3
Schizophrenic	5.2	6.6	5.9	3.0	1.1	2.0

* Speech conditions were significant at $p < .005$.

** Groups were significant at $p < .025$. See Table 9(c).

TABLE 9(b)

ANALYSIS OF VARIANCE:

EXPLAINING

Source	dF	MS	F
Sex (A)	1	48.95	1.33
Groups (C)	3	123.69	3.36+
A x C	3	48.98	1.33
Speech Conditions (B)	1	406.08	10.64'
A x B	1	36.39	.95
B x C	3	19.06	.49
A x B x C	3	21.95	.57
Within Groups	72	38.15	

+ $p < .025$

' $p < .005$

TABLE 9(c)

t-TEST MULTIPLE MEAN COMPARISON:

EXPLAINING

C	1	2	3	4
1		3.13*	2.71*	4.11*
2			.42	.98
3				1.40
4				

* α .05

TABLE 10(a)

DIRECT REFERENCES

Groups*	Unstructured			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	3.8	2.8	3.3	1.3	3.3	2.3
Paranoid schizophrenic	3.7	5.8	4.8	1.6	5.2	3.4
Alcoholic	0.4	2.7	1.5	7.1	2.4	4.8
Schizophrenic	3.5	4.6	4.1	12.0	5.1	8.5

* Groups were significant at $p < .05$. See Table 10(c).

TABLE 10(b)

ANALYSIS OF VARIANCE:

DIRECT REFERENCES

Source	dF	MS	F
Sex (A)	1	1.58	.05
Groups (C)	3	99.65	3.20*
A x C	3	60.63	1.94
Speech Conditions (B)	1	70.62	2.13
A x B	1	71.69	2.16
B x C	3	87.44	2.64
A x B x C	3	81.51	2.46
Within Groups	72	33.06	

* $p < .05$

TABLE 10(c)

t-TEST MULTIPLE MEAN COMPARISON:

DIRECT REFERENCES

C	1	2	3	4
1		1.31	.38	3.52*
2			.93	2.21
3				3.14*
4				

* α .05

TABLE 11(a)

EXPRESSIONS OF FEELING

Groups***	Unstructured*			Structured		
	M**	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	9.9	15.5	12.7	1.4	0.9	1.1
Paranoid schizophrenic	3.8	11.4	7.5	2.5	3.0	2.7
Alcoholic	4.1	15.8	9.9	0.1	4.3	2.2
Schizophrenic	19.5	5.6	12.5	1.8	4.2	2.9

* Speech conditions were significant at $p < .001$.

** Sex and groups interacted at $p < .01$. See Table 11(c).

*** Sex, speech conditions, and groups interacted at $p < .005$. See Table 11(d).

TABLE 11(b)

ANALYSIS OF VARIANCE:

EXPRESSIONS OF FEELING

Source	dF	MS	F
Sex (A)	1	195.59	2.59
Groups (C)	3	50.52	.66
A x C	3	331.69	4.39"
Speech Conditions (B)	1	2849.14	40.41#
A x B	1	11.68	.16
B x C	3	81.57	1.15
A x B x C	3	338.90	4.80'
Within Groups	72	70.50	

" $p < .01$

# $p < .001$

' $p < .005$

TABLE 11(c)

t-TEST MULTIPLE MEAN COMPARISON:

EXPRESSIONS OF FEELING

AC	11	12	13	14	21	22	23	24
11		2.51	3.49	5.01	2.59	1.54	4.45	.73
12			.98	7.52*	5.10	4.05	6.96*	1.78
13				8.50*	6.08*	5.03	7.94*	2.76
14					2.42	3.47	.56	5.74*
21						1.05	1.86	3.32
22							2.91	2.27
23								5.18
24								

* α .05

TABLE 11(d)

t-TEST MULTIPLE MEAN COMPARISON:

EXPRESSIONS OF FEELING

ABC	111	121	112	122	113	123	114	124	211	221	212	222	213	223	214	224
111		8.51*	6.12	7.41	5.75	9.75*	9.63*	8.13*	5.64	8.97*	1.47	6.91	5.96	5.58	4.28	5.70
121			2.39	1.10	2.76	1.24	18.14*	.38	14.15*	.46	9.98*	1.60	14.47*	2.93	4.23	2.81
112				1.29	.37	3.63	15.75*	2.01	11.76*	2.85	7.59	.79	12.08*	.54	1.84	.42
122					1.66	2.34	17.04*	.72	13.05*	1.56	8.88*	.50	13.37*	1.83	3.13	1.71
113						4.00	15.38*	2.38	11.39*	3.22	7.22	1.16	11.71*	.17	1.47	.05
123							19.38*	1.62	15.39*	.78	11.22*	2.84	15.71*	4.17	5.47	4.05
114								17.76*	3.99	18.60*	8.16*	16.54*	3.67	15.21*	13.91*	15.33*
124									13.77*	.84	9.60*	1.22	14.09*	2.55	3.85	2.43
211										14.61*	4.17	12.55*	.32	11.22*	9.92*	11.34*
221											10.44*	2.06	14.93*	3.39	4.69	3.27
212												8.38*	4.49	7.05	5.75	7.17
222													12.87*	1.33	2.63	1.21
213														11.54*	10.24*	11.66*
223															1.30	.12
214																1.42
224																

* α.05

TABLE 12(a)

EVALUATORS

Groups	Unstructured*			Structured		
	M	F	$\bar{X}\Sigma$	M	F	$\bar{X}\Sigma$
Normal	6.7	3.4	5.0	2.8	1.7	2.2
Paranoid schizophrenic	8.8	7.0	7.9	1.3	3.3	2.3
Alcoholic	6.9	3.0	4.9	4.2	4.2	4.2
Schizophrenic	1.7	6.3	4.0	2.8	0.4	1.6

* Speech conditions were significant at $p < .001$.

TABLE 12(b)

ANALYSIS OF VARIANCE:

EVALUATORS

Source	dF	MS	F
Sex (A)	1	22.13	1.00
Groups (C)	3	40.64	1.85
A x C	3	28.37	1.29
Speech Conditions (B)	1	333.79	13.98#
A x B	1	4.71	.19
B x C	3	40.98	1.71
A x B x C	3	64.77	2.71
Within Groups	72	23.87	

# $p < .001$

TABLE 13

VERBAL BEHAVIOR OF THE PARANOID SCHIZOPHRENIC GROUP

Predictions	Results
High Negators score	Not significant; score in predicted direction.
High Direct References score	Not significant; score in predicted direction.
High Explaining score	Significant at $p < .05$; not in predicted direction.
High Evaluators score	Not significant; score in predicted direction.
Higher scores for these scales in the unstructured condition.	In the predicted direction with the exception of the Negators scores.

TABLE 14

VERBAL BEHAVIOR OF THE ALCOHOLIC GROUP

Predictions	Results
High Intrusions score	Score in predicted direction.
Low Nonpersonal References score	Significant at $p < .05$.
High Expressions of Feeling score	Not significantly different.
High Retractors score	Score in predicted direction.
Magnitude of scores greater in predicted direction for unstructured condition.	Intrusion and retraction scores greater in the structured condition.

TABLE 15

VERBAL BEHAVIOR OF THE SCHIZOPHRENIC GROUP

Predictions	Results
High Intrusion score	Score in predicted direction.
Low Time References score	No significance.
High Evaluators score	No significance.
Score magnitudes are greater in the unstructured condition.	Intrusion score greater in structured condition, but not significantly.

DISCUSSION

The goal of this investigation was to relate specific verbal behaviors, behaviors theorized as representing certain mental mechanisms in a psychoanalytic framework, to clinical populations which theoretically should manifest typical mental defenses. The control group's verbal performances were used as the behavioral standard against which the performances of other groups were compared.

Unpredicted Findings and Unexpected Experimental Factors

A number of statistically significant mean differences were found which were not predicted. These significances with pertinent groups and measures are presented in Table 16.

Many factors played a part in determining the verbal behavior of a particular volunteer patient under the experimental conditions - conditions which necessitated the subject's entering a building presumably associated with a more or less traumatic event (admission to the hospital), reporting to an unknown staff member in a strange office, and speaking for the first time into a microphone attached to a recording instrument. Even for the cognitively healthy individual an experience of this kind quite probably arouses feelings of anxiety and uncertainty.

Some of the female subjects were hesitant to talk to the male experimenter under the experimental conditions. These particular subjects were afraid of revealing sincere emotions, one of which was sexual attraction,

TABLE 16

SIGNIFICANT UNPREDICTED RESULTS

Group*	Scale	Significance
Paranoid Schizophrenic	Lower Explaining score	$p < .05$
Alcoholic	Lower Explaining score	$p < .05$
Male Alcoholic	Higher Rate of Speech score	$p < .05$
Schizophrenic	Lower Explaining score	$p < .05$
Schizophrenic	Higher Direct References score	$p < .05$
Male Schizophrenic	Higher Expressions of Feeling score	$p < .05$
Sex**		
Female	Higher Negators score	$p < .001$
Female	Higher Time References score	$p < .025$
Speech Condition***		
Unstructured	Higher Quantity of Speech score	$p < .001$
Unstructured	Lower Silence Time score	$p < .001$
Unstructured	Lower Nonpersonal References score	$p < .001$
Unstructured	Lower Negators score	$p < .05$
Unstructured	Higher Time References score	$p < .001$
Unstructured	Lower Retractors score	$p < .001$
Unstructured	Higher Explaining score	$p < .005$
Unstructured	Higher Expressions of Feeling score	$p < .001$
Unstructured	Higher Evaluators score	$p < .001$

* Group compared with controls.

** Compared with males.

*** Compared with the structured speech condition.

before the experimenter and were hard pressed to find other material for verbalization. The experimenter gained knowledge of this behavior in one instance via a subsequent interview with the subject and in other instances during conversations with ward personnel. A sex factor, therefore, was present in determining verbal performance. Other patients were concerned that their talks might be made a part of their hospital records. Some of the patients preferred to maintain their positions as patients, rather than as subjects, not wishing to upset their routine. About a quarter of the alcoholic subjects were concerned with possibly having to remain in the hospital for a longer period of time as a result of their participation and disclosures of certain subject matter during the talks. A number of the controls qua employees, especially in the unstructured speech condition, acted as if they were defending their jobs. They obviously suspected that the researcher was evaluating their work habits. In other words, it appeared that with some individuals of each group, patient and control, a direct threat to personal security was perceived. Numerous patient statements reflected a suspicion that there existed ulterior motives accounting for their being selected as subjects. These are a few of the factors which undoubtedly influenced subject performances. However, the experimental setting and the thoughts, beliefs and attitudes of particular personalities did not detract from the investigator's intent to relate observed behaviors to the mental mechanisms of psychoanalytic theory. These behavioral responses are considered relevant information provided by the study. The most prominant verbal differences were found when the unstructured speech condition was compared to the structured speech condition. The Quantity of Speech, Silence Time, Nonpersonal References,

Negators, Time Reference, Retractors, Explaining, Expressions of Feeling, and Evaluation measurements reflected significant behavioral differences under these two speech conditions. Based on clinical observation more stress, anxiety, and tension appeared present in the free speech condition, the condition in which the subject was instructed to furnish his own speech topic. This observation is consistent with Weintraub and Aronson's report (1962) that some subjects under an experimental condition of this kind often find it so stressful that they react with total silence; other subjects recite memorized bits of information, according to Weintraub and Aronson.

Paranoid Schizophrenic Group

In discussing the paranoid schizophrenic group it may be profitable to construct a model outlining the behavioral pattern of this group together with the inferred psychological defense mechanisms involved. Figure 1 shows how the model compares paranoid schizophrenic speech peculiarities found in this study. The model presented here and the two to follow are speculative and merely reflect an attempt to project the findings within a psychoanalytic frame of reference.

It was mentioned above that Freud (1911) reported denial and projection to be basic mechanisms in a paranoid conflict. The verbal counterparts of these mechanisms are a high Negators score and a high Direct References score, respectively. In the schizophrenic projection or denial as a problem in preception is described as a process of selective attention or inattention and functions to maintain perceptual equilibrium (Bellak, 1958). As an additional psychodynamic, Rapaport (1951) stated that paranoid individuals utilize the intellectual defense of rationalization. According

FIGURE 1. Diagrammatic representation of the speech behavior pattern of paranoid schizophrenic patients and its inferred relationship to psychological defense mechanisms.

Psychodynamics	Verbal Behavior
1. Denial	1. High Negators score.
2. Projection	2. High Direct References score.
3. Guilt feelings evoke hostile thoughts	3. High Evaluators score.
4. --	4. Low Explaining score.

to Weintraub and Aronson (1965) a high Explaining score is a behavioral counterpart of rationalization.

The results of this research supports Weintraub and Aronson's findings that Negators and Direct References may be inferentially related to the psychodynamics of paranoid schizophrenia, but not unequivocally, and the "explaining" behavior, unless a suitable alternative is offered, may not be related at all. Remember that the mean differences for the measures above, with the exception of Explaining scores, were not significantly different although they were greater in the direction predicted. A possible interpretation, one that has occurred to the experimenter, is that with protracted hospitalization the unique and idiosyncratic behavior which is initially responsible for the patient's admission and subsequent diagnosis becomes maintained only in a subdued and practically functionally autonomous manner. The need to use self-preserving mental defenses continues to exist, but decreasingly so. Situational pressures which precipitated the need for those defenses may be partially or totally removed. A leveling effect of unique behaviors within the patient population possibly follows as hospital stay increases. It is suggested that the Explaining score is significant in the direction opposite to that predicted not because of the paranoid schizophrenic performance but rather because of the employees' behavior. The control group had by far the greatest Explaining score of all the groups. Apparently their concern about being evaluated, although misplaced, increased their use of rationalization and, concomitantly, their performance scores.

Alcoholic Group

The psychoanalytic theory of alcoholism proposes that alcoholism results

as a threat to oral-dependent gratification (Higgins, 1953), as a defense mechanism against various sources of anxiety, and occurs in individuals who are impulsive and self-preoccupied (Weintraub and Aronson, 1964, 1967, 1969). Weintraub and Aronson related a high score on Intrusions to anxiety, a low score on Nonpersonal References to self-preoccupation, a high score on Retractors to impulsivity and the defense of undoing. Expressions of Feeling inversely correlated with Nonpersonal References. The scheme in Figure 2 shows the behavioral pattern of the alcoholic group with the psychodynamic mechanisms involved.

The data support Weintraub and Aronson's assumption that a low score on Nonpersonal References bears an empirical relationship to the performances of self-preoccupied individuals. Results were significant and in the direction indicated. The alcoholic group's performances on the Intrusions and Retractors scales were in the direction predicted when compared to the control performances, but were not significantly different. The idea that patient behavior is modified by prolonged hospitalization, effecting a leveling of its extremes, is again offered. A high Expressions of Feeling score was predicted based upon a reported inverse correlation with Nonpersonal References. The score was lower rather than higher, but not significantly so. The inverse correlation of these two scales was initially found using normal speakers as subjects (Weintraub and Aronson, 1962). The interpretation which immediately offers itself is that information gained from a correlational study using normal subjects is not generalizable to performances of other groups. Based on clinical impressions this researcher offers the suggestion that alcoholics score lower on Expressions of Feeling for the reasons that the capacity to appreciate positive affect is alien

FIGURE 2. Diagrammatic representation of the speech behavior pattern of alcoholic patients and its inferred relationship to psychological defense mechanisms.

Psychodynamics	Verbal Behavior
1. Anxiety	1. High Intrusions score.
2. Defensive avoidance /Self-preoccupation	2. Low Nonpersonal References score.
3. Inability to express affect	3. Low Expressions of Feeling score.
4. Defensive undoing	4. High Retractors score.

to them, and that they have difficulty tolerating negative affect. It has been reported that escape via alcohol from negative affect is one of the rewards of drinking behavior (Steele, 1970).

Schizophrenic Group

The personality pictures of schizophrenic individuals frequently reflect the presence of intense anxiety usually centering around a fear of losing one's identity (Rosenfeld, 1950), an imprisonment in the present and to immediate experiences (Searles, 1955), and a harsh super-ego serving to account for fragmentary verbal communications (Searles, 1961). Fromm-Reichmann (1959) pointed out that extraordinarily high levels of anxiety which produces disorganization is a result of the schizophrenic's intense need for dependency and the arousal of intense feelings of hostility. This theoretical position does not parallel Rosenfeld's, but both theorists recognize the presence of anxiety in schizophrenia. Verbal behaviors predicted as reflections of these dynamics were a high score on Intrusions, a low score on Time References, and a high score on Evaluators. A high score on Evaluators was predicted as an attempt to find evidence concerning Weintraub and Aronson's idea that an individual with a hypertrophied super-ego might score high in this category (Weintraub and Aronson, 1962). Figure 3 shows the verbal behavior pattern and its inferred relationship to psychological defense mechanisms.

Results showed that the number of Intrusions were greater in the schizophrenic group, though not significantly so. It should be pointed out that every group showed clinical signs of situational anxiety in the laboratory setting. All performances in this research were probably substantially influenced by anxiety, enough so to make reliable group

FIGURE 3. Diagrammatic representation of the speech behavior pattern of schizophrenic patients and its inferred relationship to psychological defense mechanisms.

Psychodynamics	Verbal Behavior
1. Anxiety lest identity is lost	1. High Intrusions score.
2. --	2. Low Evaluators score.
3. Indication of pessimism	3. High Time References score.

mean comparisons on an anxiety measurement difficult. The role of intrusions in speech reflecting an indication of anxiety and situational tension cannot be uncritically accepted. In this study the Intrusions results were not definitive. The Evaluators scale does not appear, either empirically or clinically, to be a measure of behaviors resulting from a hypertrophied super-ego. What it does measure is open to speculation. Schizophrenic patients may be prisoners to immediate experience (Searles. 1955) but they make references to the past half again as often as normal subjects. This fact is not statistically significant but it is a behavior one notices. This observation does not support Searles' (1955) statement that schizophrenics are more attuned to current experience. It does generally agree, however, with Fairbanks' (1944) study which showed that schizophrenics were more preoccupied with the past, as judged by verb tense, than were normal college students. After lengthy hospitalization patients may find relief in talking of better days when they were 'free' and at home with their families. The experimenter suspects there is a greater use of the past tense by individuals who have cause to be pessimistic, while there is a greater use of present and future tense by those who have less reason for pessimism or more for optimism.

Control Group

Some general remarks may be made concerning the verbal performances of the control group. This group, as one might expect, spoke more and had less silence time than did any of the other groups. They made fewer references to the past than did any of the other groups, a fact which supports an interpretation given previously that the non-hospitalized subjects have more to look forward to and are more future oriented than

hospital subjects. They also used explaining more than did any other group. Concerning this behavior, the speculation was made that they were defending their hospital positions and rationalizing their work performances.

It would not be superfluous to mention a shortcoming of the study. The control subjects were employees of the hospital. There were certain advantages to using employees as subjects; they were locally accessible and mostly cooperative, but, regretfully, a number of the employees were also somewhat situationally insecure. They did not understand in what way they were being compared to the patients, and they could not be so informed prior to the data collection. Undoubtedly, these factors altered in some degree their overall performance profile.

It is recognized that the ideas and speculations presented in this study may be open to other possible interpretations. The extent to which these findings are characteristic of similar diagnostic groups in other hospitals and locales is subject to further investigation.

APPENDIX A

ULLMANN AND GIOVANNONI SELF-REPORT INDEX

Reactive*

T 1. I am married now.

T 2. I have fathered children.

T 3. I have been married.

T 4. Before I was seventeen I had left the home I was raised in and never went back except for visits.

F 5. When I leave the hospital, I will live with one or both of my parents.

T 6. As a civilian I have worked steadily at one job or for one employer for over two years.

T 7. I finished at least one year of education after high school - trade apprenticeship, business school, college, etc.

F 8. Adding up all the money I earned for the last three years, it comes to less than $700, before deductions.

T 9. In my teens I was a member of a group of friends who did things together.

F 10. I hardly ever went over to another kid's house after school or on weekends.

F 11. When I was in school I didn't like Physical Education classes.

F 12. Alcohol has nothing to do with my difficulties.

T 13. I have paid regularly to buy a house.

T 14. More than once in the last year I have stayed on after some group meeting and talked with some other members about something that went on.

T 15. Shortly before I came into the hospital there was some major change in my life - such as marriage, birth of a baby, death, injury, loss of job, etc.

T 16. I have been deeply in love with someone and have told them about it.

Reactive*

T 17. In the kinds of work I do, it is expected that people will stay for at least a year.

F 18. My top wage in the last five years was less than $1.25 an hour.

T 19. I have earned my living for longer than a year at fulltime civilian work.

F 20. I have had to stay in a mental hospital more than one year at a time.

F 21. Within the last five years I have spent more than half of the time in a mental hospital.

T 22. In my teens I was a regular member of a club or organization that had a grown-up who came to meetings (Scouts, school club, 4-H, church youth, etc.).

T 23. In my teens there was more than one girl with whom I had more than 2 dates.

T 24. When I leave the hospital, I will live with my wife.

* Thirteen or more True/False differences were considered as an index of processive development.

APPENDIX B

VERBAL BEHAVIOR ANALYSIS SCORE SHEET

Name _____ # _____

Age _____ Race _____ Diagnosis _____

Education _____ Sex _____

Occupation _____ Time in Hospital _____

Scores		Scores	
_____	Quantity of Speech (QS): # words spoken	_____	Intrusion (I): score _____ X $\frac{1000}{\#\text{ words}}$
_____	Silence Time (ST): Total seconds of silence	_____	Retractors (R): score _____ X $\frac{1000}{\#\text{ words}}$
_____	Rate of Speech (RS): per minute _____ $\frac{\#\text{ words spoken}}{\text{min. of speech}}$	_____	Explaining (Ex): score _____ X $\frac{1000}{\#\text{ words}}$
_____	Nonpersonal References (NR): _____ $\frac{\#\text{ NR}}{\text{NR + PR}}$ X 1000 (Personal Ref.) NR_____ PR_____	_____	Direct References (DR): score _____ X $\frac{1000}{\#\text{ words}}$
		_____	Expressions of Feeling (ExF): score _____ X $\frac{1000}{\#\text{ words}}$
_____	Negators (N): score _____ X $\frac{1000}{\#\text{ words}}$	_____	Evaluators (Ev): score _____ X $\frac{1000}{\#\text{ words}}$

Time Reference (TR):

_____	_____	_____	score (past) _____	X $\frac{1000}{\#\text{ words}}$
Past	Present	Future	score (present) _____	X $\frac{1000}{\#\text{ words}}$
			score (future) _____	X $\frac{1000}{\#\text{ words}}$

APPENDIX C

MEANS AND RANGES FOR AGE, EDUCATION, AND LENGTH OF HOSPITALIZATION

	Group Means, $\bar{X}$	Ranges
Total Subjects, Ss		
Age	40.88 yr.	20 - 57
Education	10.22 yr.	6 - 17
Hospitalization	Schiz. 11.73 yr.	1 mo. - 37 yr.
	Alc. 44.35 days	3 days - 120 days
Alcoholics (303.2) - male		
Age	42.6 yr.	24 - 49
Education	9.15 yr.	6 - 12
Hospitalization	39.4 days	8 - 90 days
Alcoholics (303.2) - female		
Age	43.8 yr.	35 - 50
Education	11.7 yr.	10 - 16
Hospitalization	49.3 days	3 - 120 days
Paranoid Schizophrenics (295.3) - male		
Age	41.1 yr.	27 - 55
Education	10.9 yr.	6 - 17
Hospitalization	6.58 yr.	30 days - 24 yr.
Paranoid Schizophrenics (295.3) - female		
Age	47.0 yr.	28 - 56
Education	10.7 yr.	9 - 14
Hospitalization	12.8 yr.	1 - 34 yr.
Non-Paranoid Schizophrenics - male		
Age	35.4 yr.	24 - 45
Education	9.4 yr.	6 - 12
Hospitalization	9.95 yr.	1.5 - 29 yr.
Non-Paranoid Schizophrenics - female		
Age	47.0 yr.	28 - 56
Education	10.8 yr.	9 - 14
Hospitalization	14.6 yr.	19 mo. - 37 yr.
Controls - male		
Age	32.6 yr.	20 - 57
Education	10.1 yr.	7 - 14
Controls - female		
Age	39.2 yr.	21 - 55
Education	10.5 yr.	8 - 13

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VITA

Richard Lowell Steele

Born in Amarillo, Texas, August 20, 1942. Graduated from Corsicana High School in Corsicana, Texas, May 1960, Bachelor of Arts in Psychology conferred by Texas Tech University, May 1965. Master of Arts in General Psychology to be conferred by the College of William and Mary in Virginia in June 1971.

Since February 1969 the author has been employed as a Psychologist Intern at Eastern State Hospital, Williamsburg, Virginia.