A P-Technique Analysis of Patient-Treatment Interactions of Alcoholics in Recovery.

James Leander Brabham
Louisiana State University and Agricultural & Mechanical College

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Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by

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B.S., McNeese State University, 1971
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ABSTRACT

In the recent literature concerning research with alcoholics, one finds repeatedly the suggestion that the different types of alcoholics need different treatment approaches. In attempting to determine how different alcoholics respond to inpatient treatment, two male alcoholic volunteers from a Louisiana state hospital alcoholic inpatient ward were selected whose profiles on the Minnesota Multiphasic Personality Inventory classified them as representing two large, identifiable sub-types of alcoholics. One subtype was the antisocial personality type; the other was the anxious-depressed neurotic personality type as defined by MMPI responses.

Each of the two individuals was measured on four physiological and 28 psychological dimensions twice a day, seven days a week for the duration of their inpatient treatment. These observations were compiled and subjected to a factor analytic procedure which resulted in seven interpretable factors for each subject's responses. The fluctuations of these factors over time were then plotted and the resulting curves were compared for similarity of meaning and then compared for treatment implications. Four principal evaluative dimensions were found with each subject's data: Treatment Evaluation; Treatment Enjoyment; Physical Anxiety; Psychological Anxiety. Concordance between subjects on each of the principal dimensions, or factors, was significant at the .05 level or less.

Tentative interpretations of the comparisons between these two
subjects on each of these four evaluative dimensions suggested that these two men did, in fact, differ considerably in their responses to the same inpatient alcoholic treatment. These factor fluctuations over time suggested rather extreme differences, especially in the areas of Psychological Anxiety and Treatment Enjoyment. The curves representing Treatment Enjoyment were fairly complex and nearly 180 degrees out of phase. The Psychological Anxiety factor for the anxious-depressed patient showed a linear increase over the period of treatment. The factor fluctuations of the patient with anti-social features indicated a distinct reduction of Psychological Anxiety during the middle phases of treatment.

Suggestions were made for future work in this area.
INTRODUCTION

In recent years national attention has been drawn increasingly to the problems surrounding the alcoholic in society. Recent estimates of the magnitude of the alcoholism problem in the United States include 6-12 million people who are classified as alcoholics by different definitions of the term (USDC, 1975). The costs to society in monetary terms are estimated at $25 billion, including direct and indirect expenses such as: lost work time; welfare needs; education and prevention; treatment; police and corrections, etc. (USDHEW, 1974). Other costs are incalculable--the human loss to the alcoholic and his family, to the victim in alcohol-related accidents and to society in general, as alcoholism permeates all strata of society influencing the very culture itself. Understandably, a national and human problem of such proportions demands and receives a great deal of research interest.

Indeed, it would be difficult to name a research discipline that has not been involved in research concerning alcohol abuse and related issues. In spite of the huge research effort and the millions of dollars poured into rehabilitation and prevention, the number of alcoholics slowly, steadily increases (USDHEW, 1975).

An area which has experienced a great increase in research effort recently is that of the treatment afforded an alcoholic when he goes for help with his problem. Each year approximately 150,000 people whose primary diagnosis is alcoholism enter alcoholic treatment programs
for alcoholism (USDHEW, 1974). Most alcoholic treatment programs are structured around the total treatment model which usually includes medical and physical rehabilitation, psychological and psychiatric treatment, lectures, group interaction, occupational therapy, and other adjunctive therapies. Some programs offer more specific treatment approaches including aversive conditioning, token economy, disulfiram advocacy and communication training, to name only a few. The total treatment approach is, however, the mainstay of current alcoholic treatment (Blum and Blum, 1967; Catanzaro, 1968; O'Briant and Leonard, 1973; Perry, 1970). The alcoholic needing help is usually referred to the nearest alcoholic treatment facility without regard to his particular problems or needs, and once in the program, he participates in the total treatment with little special, individualized treatment being given him (Partington and Johnson, 1969; Pattison, Coe and Rhodes, 1969). Very seldom is the treatment matched to the treatment recipient, particularly in the state and federally funded programs.

In practical terms, this assignment to treatment by geographic proximity is not too irrational considering the exigencies of broad coverage and the proper husbandry of funds. These physical and financial realities coupled with the social wisdom concerning the existence of "the alcoholic personality," despite its never being found by social scientists (see below), seem to indicate that the alcoholic needs the treatment. Research in some areas of alcoholic treatment seems to confirm the worth of treatment without any attention being paid the patient-treatment interaction. Emrick (1974) reviewed 271 reports on the outcome of alcoholic treatment published between 1952-1971. In
every case some psychotherapy was given. He found that overall, without grouping programs by length, type of treatment, locale, or any other criteria, two-thirds of the alcoholics who received treatment were reported to be either abstinent or improved. Although this outcome seems optimistic for the drinker who wants to quit, Emick's (1975) expansion of that study showed some disturbing results; (a) Different treatment methods do not produce significantly different results in terms of total abstinence or reduction of drinking. (b) Again, approximately 66% of treated alcoholics were either abstinent or much improved during follow-up. And (c) Approximately 42% of alcoholics receiving minimal or no treatment became either abstinent or much improved during follow-up. "Much improved" was defined as the patient, although drinking again, was having fewer problems of the sort that brought him into the treatment facility. Although these figures seem to legitimate treatment without specific assignment, Emrick suggests that they really indicate how badly patient-treatment matching is needed. The finding that 42% of reported alcoholics receiving minimal or no treatment improved or became abstinent on their own says little for alcoholic treatment programs as they are currently structured.

The problems of predicting who will likely become alcoholic, who will be amenable to treatment and who will be more likely to drop out of a treatment program have received much attention throughout the years. Most studies by psychologists have involved some sort of test or inventory scores as predictors of alcohol-related problems and appropriateness for treatment, as well as in the massive search for the alcoholic personality, mentioned earlier. The voluminous research invested in
reducing the alcoholic problem to a simple dichotomy—alcoholic versus nonalcoholic—has produced little. The methods or measures to predict reliably who will become alcoholic, who is now an alcoholic, who will benefit from treatment have not been found. This is the conclusion of three reviews (Lisansky, 1967; Sutherland, Schroeder and Tordella, 1950; Syme, 1957) of studies published over the past twenty-five years. It is apparent from these studies that the majority of alcoholics share many personality and behavioral responses. It is not so clear, however, whether these shared features of response are predispositions to or concomitants of alcoholism. Furthermore, these shared characteristics do not reliably describe the alcoholic. Some alcoholics have many responses in common with other alcoholics, some have few, and to vitiate prediction severely, nearly all alcoholic common responses can be found in nonalcoholic samples. Wolfson (1966) observes that drinking habits are more consistent among alcoholics than are their personality functionings. The idea of a unitary personality dimension shared by all alcoholics is slowly fading away.

A different approach to the description and prediction of alcoholism based on personality and behavioral measures is one of seeking different clusters or constellations of response characteristics which in different numbers or different combinations describe general alcoholic types. This line of investigation has its problems too—different investigators found different characteristics and widely different numbers of characteristics. Machover and Puzzo (1959) found 88 descriptive characteristics of alcoholics, 23 of which they felt were very significant. Zwerling (1959) using the same data as Machover and
Puzzo referred to a "constellation of traits" which are commonly found and are possibly essential to alcoholic etiology. Wolfson (1966) found six characteristics that she feels are significant and meaningful in alcoholism. From such widely varying reports by competent researchers studying the same condition, it is probable that problems of semantics may be involved—some terms overly general, others limitingly precise—and, also, problems of statistical significance and practical meaning could be confusing the situation. Although these representative studies were no longer seeking the alcoholic personality, a unitary dimension, they were still using univariate measures which lent themselves more readily to unitary, linear relationship predictions.

Once the notion of multiple determination of a more or less unitary expression was accepted, it became obvious that multivariate methods would be required to determine the meaningful relationships. A flood of multivariate research in all areas of the alcoholic problem was the result. Many of these studies had limited value due to (a) the failure to replicate findings or (b) the uninterpretable or the non-generalizable nature of the resulting clusters or factors. The solution to these two problems involves replicating findings in terms of variables about which a meaningful body of research has been developed. In the area of alcoholic patient-treatment interactions four multivariate studies satisfying both replication and explication in meaningful terms have been reported. A summary of each follows, showing replication of findings and usable descriptions of factors utilizing Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1942) profiles.
Goldstein and Linden (1969) in an effort to support the hypothesis of the existence of more than one type of alcoholic, obtained 497 MMPI profiles from male inpatient alcoholics. This group was divided into two subsamples, 239 to the standardization sample and 258 to the replication sample. Each group of profiles was then subjected to a cluster analysis based on 15 MMPI Scales; the 3 validity scales; 10 clinical scales; Barron's Ego Strength Scale (1956) and Caudra's Control in Psychological Adjustment Scale (1956). The correlational cluster procedure resulted in 4 types being identified in both the standardization and replication samples. One hundred and fourteen patients (47%) in the standardization group were assigned to one of the four types; one hundred and six patients (41%) of the replication sample were assigned to one of the four types. The four types, the number and percentage of the total group, a profile code (Welsh, 1956), and a brief description of each type follows:

Type I accounted for 80 of the 497 patients (16.1%). The profile code was 4'32-178659/OK-LF. This profile is usually obtained from persons with emotionally unstable personalities, poor impulse control, and much poorly controlled hostility. This profile is found in several actuarial studies (Gilberstadt and Duker, 1965; Hathaway and Meehl, 1951), and is usually related to personality disorders, including alcoholism.

Type Ic accounted for 83 members of the total sample (16.7%). The profile code was 2"78413'069-5F-/LK. This profile is also found in actuarial manuals and is usually considered some type of anxiety-depressive neurosis.
Type III accounted for 47 of the alcoholic profiles (9.5%). The code was 4-290765/831F/LK. It was found in only one manual (Hathaway and Meehl, 1951), but the prime diagnosis for this profile is alcoholism, with secondary consideration of psychopathic personality.

Type IV only accounted for 10 profiles (2%), but emerged as a cluster solution on two independent occasions. The profile code was 49'37-86512/9F-KL. It is listed in Hathaway and Meehl (1951) as an alcoholic profile with secondary features of drug addiction and paranoid ideation.

Although only 45% of the total sample (N=497) was grouped, the groupings were done independently twice with the same four profiles emerging. Of particular interest are the first two types; between them they account for 33% of the total sample. Goldstein and Linden conclude that there are definitely different types of alcoholics and that the different types of alcoholics should benefit greatly from programs geared to their different needs.

Whitelock, Overall and Patrick (1971) studied 136 psychiatric patients in an effort to establish a relationship between severity of alcohol abuse and MMPI profiles grouped by cluster analysis. Another goal of their study was the development of an alcoholic abuse scale which does not pertain to the present study. A cluster analysis procedure somewhat different from Goldstein and Linden (1969) was performed on the 136 MMPI profiles. Thirteen scales were profiled—the 10 conventional clinical scales plus the three validity scales. Four profiles
emerged into which all 136 patients were assigned. In this study neither the numbers or the percentages of patients assigned to each group were given. The four coded profiles are:

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<th>Group</th>
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<tr>
<td>I</td>
<td>4'23-716589</td>
<td>KFL</td>
</tr>
<tr>
<td>II</td>
<td>218 47'396-5</td>
<td>F-/LK</td>
</tr>
<tr>
<td>III</td>
<td>472'856931</td>
<td>F-/LK</td>
</tr>
<tr>
<td>IV</td>
<td>2'8714935-6</td>
<td>F-L/K</td>
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The similarities between Whitelock, Overall and Patrick (1971) types WOP I, WOP II, WOP III and Goldstein and Linden (1969) types GL I, GL II and GL III are striking.

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<tr>
<th>Type</th>
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<tr>
<td>GL I</td>
<td>4'32-178659/0</td>
<td>K-LF</td>
</tr>
<tr>
<td>WOP I</td>
<td>4'23-716589</td>
<td>KFL</td>
</tr>
<tr>
<td>GL II</td>
<td>2'78413'069-5</td>
<td>F-/LK</td>
</tr>
<tr>
<td>WOP II</td>
<td>21847'396-5</td>
<td>F-/LK</td>
</tr>
<tr>
<td>GL III</td>
<td>4-290765/831</td>
<td>F/LK</td>
</tr>
<tr>
<td>WOP III</td>
<td>472'866931</td>
<td>F-/KL</td>
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The Whitelock, Overall and Patrick (1971) study was purposefully designed to include a wide variety of users of alcohol, some very slight, some extremely heavy users of alcohol. Their findings represented a replication of Goldstein and Linden's study and, also, extended the applicable group to include mild users of alcohol. The next two studies lend additional support to the idea of several subcategories, or types, being nested within the larger category of alcoholic. Also, applications of types of alcoholics to the patient-treatment interaction problem will be seen.
In a study of 282 male alcoholic inpatients, Skinner, Jackson and Hoffmann (1974) found eight bipolar typal dimensions which classified 158 patients (56%) according to their factor analyzed responses to the Differential Personality Inventory (Jackson and Messick, 1971). MMPI profiles were clustered on these same eight dimensions and correlated with profiles derived by Goldstein and Linden (1968) and Whitelock, Overall and Patrick (1971), as well as with several actuarial profile high point classifications. All of the Goldstein and Linden and Whitelock, Overall and Patrick types were found with high correlations except Goldstein and Linden Type IV, which was the type that accounted for only 2% of the sample in their study. Although Skinner, Jackson and Hoffmann extended their subtypes to eight, 45% of their population was classified by the first four types. Again, alcoholic subgroups which are identifiable by MMPI profiles were found, and nearly all of the previous MMPI determined subgroups were found by Skinner, Jackson and Hoffmann.

Price and Curlee-Salisbury (1975) clustered alcoholic inpatient treatment evaluations to see if subgroups could be ascertained by their evaluation of the program rather than by personality inventories. Fifty-one male alcoholic inpatients in a Veterans Hospital were asked to evaluate eight treatment aspects within a few days of their discharge from the program. The eight treatment aspects were: a) lectures, b) group therapy, c) Twelve Steps, d) family nights, e) individual counseling, f) family counseling, g) free time, and h) coming into the hospital. Each of these treatments was evaluated along eight treatment response dimensions developed by Moos (1969). These dimensions were:
a) Perceived worth, b) Pleasantness, c) Vigor, d) Loneliness, e) Anxiety, f) Therapeutic benefit, g) Affiliation, and h) Participation.

The evaluations by the patients consisted of ranking each of the eight treatment aspects on each of the eight response dimensions. Concerning the evaluation procedure itself, two interesting points developed.

The first was that the patients were able to differentiate the content of the response dimensions. The second was that the patients seemed to be using a single underlying evaluative dimension in evaluating the different treatments. This dimension seemed to extend from Perceived worth, Therapeutic benefit and Pleasantness (all of which showed identical rankings) to Anxiety and Loneliness.

After the cluster analysis of the rankings had been done, it was clear that there were three very different profiles of evaluation in the sample which accounted for 41 of the 51 alcoholics. These three groups were equally different on their respective mean MMPI profiles. These profile codes were:

Cluster A: 4'29'138765-0 F-KL
Cluster B: 8'74219'3605 F'-Lk
Cluster C: 2'143789'065 F-l/k

These clusters show some similarities to the previous clusters cited above; the difference could be a function of what Goldberg (1972) referred to as a low signal-to-noise ratio due to the small number of profiles in each cluster (Cluster A = 12, B = 9, C = 20). It seems that a better way of evaluating the interaction, for future application at least, would be to cluster independently the MMPI profiles and check for agreement between the members of the two cluster analyses.
Several ideas seem to be supported by the above studies, even though they were of different design and some had different goals. One result shown repeatedly is that there are identifiable subgroups in the broad nosological category "alcoholism." Another point illustrated is that these subgroups can be identified in terms of MMPI profiles, thereby utilizing the vast research which has grown around that instrument. Another finding is that alcoholics can be subgrouped on bases other than the MMPI and then the MMPI profiles of those subgroups compiled to form meaningful (in MMPI terms) mean profiles. This research approach seems to be getting at factors that are of diagnostic as well as treatment-prediction value. The study by Price and Curlee-Salisbury (1975) took a step in that direction. However, some problems are inherent in their study of patient-treatment interactions. The major problem appears to be that the program evaluation by the patients coming at the end of the treatment suffers, possibly, from reactive effects as well as recency effects. The anticipated release from the institution could color or distort the previous feelings felt by the patients. Also, the processes of learning how to be a psychiatric patient as well as the effects of institutionalization could distort responses toward the end of the program. Some of these questions could be answered by taking the measures earlier in the program, at the risk of losing later evaluations, or even better, by taking numerous measures over the entire period of treatment and analyzing them.

A method of analyzing interactions of this sort is the P-technique. First suggested by R. B. Cattell in 1943, the P-technique
is a factor analytic technique which uses measures taken in situ, as it were, over a great number of occasions and through factor analytic procedures shows the underlying clusters of variables (factors) which fluctuate over time. In any research project the experimenter has three variables he can juggle: 1) subjects, 2) tests or observations, 3) occasions. In the factor analytic application of these variables, how one works with these ingredients determines which technique is needed.

The major techniques are Q-, R-, incremental or differential R-, O-technique, and P-technique. To define further the P-technique by contrast, a brief description of these is set out below.

R-technique is a method which measures on one occasion a group of people on the same instrument, or observation, and then the data are factored in a search for the interindividual differences, or traits. This technique holds occasion constant and correlates tests on subjects (Cattell, 1950).

Q-technique is the transpose of the R-technique and correlates persons on tests. This technique is useful in typology. For instance, how a person orders a list of statements can be used in determining how he fits in the population of subjects who have ordered that list and, additionally, if a trait is assigned to the task and if a large number of these trait-tasks are performed, the person can be typed or assigned a value on each of the traits being examined. Q-technique has the problem of limited generalizability, but when used as a method of finding types which are highly representative of factors found by other methods, particularly R-technique, it can be used gainfully in personality research (Cattell, 1950). The equivalency of Q- and R-techniques is not
wholly accepted (Cattell, 1952; Stephenson, 1952), nor is the meaningfulness of most Q-technique factors, due to problems of scaling, validity and reliability of measures (Mowrer, 1953).

Differential or incremental R-technique is the R-technique but with the measures repeated two or more times and the changes noted being correlated and factor analyzed. This and P-technique are the two major methods of researching state factors (Cattell, 1963).

O-technique is the transpose of P-technique. Whereas the P-technique is a series of measures taken on the same subject over an extended number of occasions and these changes analyzed and, hopefully, interpreted, the O-technique uses profiles correlated over occasions (Cattell, 1953).

Some basic considerations in conducting a P-technique study concern number of observations, type of observations, goals and interpretations. In general, the mathematical manipulations are unwieldy, at best, for most investigators demand at least 60 occasions--if one is using 40 measures the result is a 40 X 60 matrix. Cattell and others feel that with computer programs more P-technique studies will be undertaken.

The measures one selects for a P-technique must satisfy demands of equivalency to make correlations meaningful, while, at the same time, the measures cannot be such that repetitions of the task results in any change of itself. The measures must have good reliability, for the changes over time must be truly measurable changes and not a reflection of an unreliable instrument. However, changes that are considered "error" in test-retest reliability studies are the dependent measures in
a P-technique study.

Once the investigator has defined his problem and selected his subject, he then needs a group of measures which satisfies the above requirements, bearing in mind that factor-analysis is only a method of interpreting data. Factor-analysis cannot generate results nor can it show relationships for which representative data have not been supplied.

Assumptions when using P-techniques are similar to other factor methods once it is understood that the sample used is of occasions rather than subjects or tests. One special property of this sample is that it is a time series with the one-way influence of time series—learning, expectancy, boredom, etc. Another is that N=1 and, therefore, the measures are highly correlated, but the analysis is factoring changes, in fact, changes in standard scores. One major problem with these changes, however, is that the changes themselves are not totally independent, each one being, to some extent, influenced by the same conditions which influenced previous changes. From some positions this is a serious problem which serves to reduce significantly the degrees of freedom (Holtzman, 1962). Cattell (1963), however, feels that this problem of autocorrelation is no problem at all; in fact, he feels that the usual degrees of freedom are appropriately applied in P-techniques, for the autocorrelations are part of what the researcher should be looking for. Holtzman (1962) also criticizes most P-technique studies for the failure by the researcher to look for lagged effects. Lagged effects are correlated observables consistently separated by time, e.g., a hangover follows an overindulgence. Holtzman suggests that it is reasonable to expect some lag of effects particularly when one deals
with both psychological and physiological measures, and he feels that these delayed effects should be taken into consideration.

An example of a published P-technique study will show both the procedures and the potential of P-technique.

Luborsky (1953) conducted a P-technique study of a patient who had a long peptic-ulcer history. The patient met with the researcher for two hours each day for 54 days. One hour was spent in repetitive testing, the other was spent recording dreams and free association. Forty-six variables in five major groupings were measured. The five groups with some of the individual measures are:

(a) Physiological: Bio-chemical.
   Glucose concentration, white cell count, salivary pH, salivary quantity.

(b) Physiological: Total organism.
   P.G.R., urination frequency, stomach awareness, hours sleep.

(c) Psychological: Objective.
   Myokinesis, speed of writing and multiplying, perseveration, fluency of association verbal and drawing.

(d) Psychological: Rating.
   Cooperative versus obstructionist, emotionality versus calmness, cheerful versus worrying.

(e) Psychological: Self-rating.
   Subject's attitude to therapy, strength of interest in food, sex and social activities.

Nine factors came from this study, some psychological and some
physiological. The outstanding association with stomach pains was found to be the anxiety factor Surgency versus Desurgency.

Although this study is a good illustration of the P-technique, some strong conclusions can also be drawn from this study.

(a) Daily variations show functional correlations and are large enough to correlate and factor analyze.

(b) By and large, these factors from a P-technique match closely the factors found by R-technique.

(c) Symptoms can be locked into the general structure of personality factors.

The P-technique appeared to be a very good method of analysis for use with problems such as the exploring of patient-treatment interactions. However, of the several published P-technique studies, none appears to have been done within an ongoing group-oriented treatment setting. Therefore, one of the major questions that this study concerned itself with was: "Can the P-technique, with its particular problems of data collection, be employed within a treatment structure without either disrupting the treatment process or else sacrificing meaning information, i.e., physiological variables, selection criteria, meaningful psychological variables?" It was decided that by a judicious selection of variables both treatment efficiency and study meaningfulness could be preserved. Another major question spurring this investigation was one of whether or not representatives of identifiably different alcoholic types would respond over time in manners which were recognizably different and meaningful when their responses were measured and analyzed by P-technique methods.
For this study, due to their representative percentages in alcoholic populations, alcoholics presenting MMPI profiles identifiable as GL Type I from the Goldstein and Linden (1969) study were compared with GL Type II alcoholics in terms of their responses to treatment, as determined by P-technique methods. The hypothesis tested was that GL Type I alcoholics and GL Type II alcoholics would show meaningful and interpretable differences in their responses to inpatient treatment for alcoholism, as shown by P-technique methods and analysis. Demonstrating these differences would open another pathway toward settling the issue of different treatments for different types of alcoholics. There are no previous studies in this particular method of research with this population from which a priori response differences, as suggested by the P-technique, could be hypothesized. However, from the wealth of MMPI actuarial studies with alcoholics and from the different evaluations found by Price and Curlee-Salisbury (1975), different patient-treatment interactions as functions of the patient's changes within himself and his interaction over time with specific treatment modalities were expected to be found. It was felt that these different interactions would be manifested by different physiological responses as well as by different psychological and treatment evaluation responses between alcoholic types.

Although the P-technique method probes occasion-to-occasion changes, it was felt that some estimate of overall change was needed in order to determine treatment effects of the whole treatment program. Therefore, a pretreatment and posttreatment battery of tests was included with which any resulting significant changes in test responses could be
compared with the intratreatment changes indicated by the P-technique.

It was intended that several representatives of GL Type I and of GL Type II would be included in this study; however, during the time of the study only one of each GL type met the study's criteria. The population percentages of each type as found by Goldstein and Linden (1969) seemed to hold true for the treatment population of this study, but other selection criteria excluded many from the study who would have qualified merely on the basis of their MMPI profiles. Each of the two patients who participated in the study and whose responses are presented in this paper, must be considered as individual subjects in separate studies, each with \( N = 1 \), as all analyses and interpretations were conducted independently; only the results were compared.
METHOD

Subjects

Two newly-admitted male volunteers were selected from the Alcoholic Treatment Service (ATS) at Southeast Louisiana State Hospital at Mandeville, Louisiana. The two men were very clearly informed concerning the whole study, the measures to be used and the goals of the study. They signed a statement of completely informed consent. As well as being informed volunteers, the men met certain criteria which assured at least a rough approximation of alcoholic typicality: at least normal intelligence; some family involvement (at least one participant in family therapy); voluntary participation in the treatment; no charted evaluation of cerebral organicity; no psychiatric dysfunctioning atypical of the broad group alcoholics; age between 33 and 45 years; no previous inpatient attempts at sobriety.

In addition to the above criteria, one of the patients, Chester, was selected on the basis of his MMPI profile's closely approximating Goldstein and Linden's GL Type II, and the other patient, Paul, was selected due to his MMPI profile closely fitting GL Type I. Other than meeting the rather rigid MMPI requirements for participation in the study and the rather general biological requirements, the men were from the population alcoholic, with no efforts exerted to match them further. A brief description of the two selected volunteers follows.
Paul was a 43 year-old white male professional salesman who reported a drinking history spanning 22 years. He felt that his drinking became heavy nine years ago and that he became very concerned about it five years ago. He presented an intelligent, superficially friendly attitude, and he appeared to stress both his intelligence and his social exactness. He appeared rigid, aloof and somewhat socially manipulative.

He was the only child of a middle class New Orleans family; he described his mother as domineering and his father as a hard-worker. He described his relationship with his father as excellent. He finished high school and attended Tulane University for two years, majoring in civil engineering. He reported that he felt the need to be on his own and, consequently, quit college and joined the U. S. Navy for two years. Upon discharge he returned to New Orleans unsure of what he wanted to do and spent the next year or so "living like a playboy." At this point in his life he started drinking socially. He ended his frivolous life by marrying and taking a job almost simultaneously.

He described his marriage as "all right" and said that he never felt close to his wife, but he remained married 14 years. He stated that he loved his three children resulting from the marriage, but stated that he did not feel particularly close to them either. He had been separated legally and physically for two years prior to entering this treatment. His wife initiated the separation due to her wanting more out of life and out of the marriage, by his report.

Paul had only three jobs in his life: first job selling
wholesale foods for four years; second job selling wholesale foods for fourteen years; and third selling import automobiles for two years. He was still employed on his third job; his accumulated sick-leave was paying him during the alcoholic treatment. He denied drinking as causing any job changes and stated that he had always maintained a substantial savings account.

He reported that his drinking was done at home or at a tavern within walking distance from his home. He denied any of the usual alcoholic problems--blackouts, DT's, legal problems, financial problems, employment problems, etc. He did feel that drinking had aggravated his marital problems and, also, that drinking had caused him to have reduced control of his life. He also felt that he was missing a lot of life's benefits by drinking. He denied any personality changes while drinking and, when questioned as to the effects of drinking upon him, stated simply that it relaxed him. He vividly recalled his first drink.

Overall impression from the first interview was of a very individualistic person who placed himself somewhat above the ordinary experiences of life and who maintained this superior attitude in his emotional relationships, precluding any spontaneous warmth or depth in his human dealings. Psychological testing reflected that impression also.

Paul readily agreed to participate in the study. His pre-treatment MMPI profile was 4'3-29 67/518:0 K-L/F. This fit very well the profile GL I.

Chester

Chester was a 34 year-old white male unemployed heavy equipment
operator who reported a 17 year history of drinking, most of it heavy
drinking. His drinking began to concern him greatly approximately four
years ago. Chester presented a very friendly, ineffectual and self-
deprecatory style of interaction. He appeared to stress being amiable
and being constantly deferential. Chester seemed extremely flexible
and willing to go with the strongest wind.

He was the middle of five children who lived in modest circum-
stances in southern Florida. Chester's memories of his mother concerned
her being bedridden all of his life until she died, when Chester was
eight years old. He was reared by his father, with whom he reported
having a very good relationship. Chester quit school in the tenth
grade to go to work following the harvests across the South. He did
this for about three years then returned to Florida, where he got
married and began working as a heavy equipment operator. Since that
time he has had only two jobs—one lasting twelve years; the second
lasting two years. Chester stated that both jobs were terminated by the
companies' going out of business. At the termination of the second
job, approximately two years ago, Chester came to New Orleans and began
working with his brother who, according to Chester, is a slipshod sub-
contractor doing residential remodeling. Chester denied that his
drinking had caused him any employment problems due to the large amount
of time that his employments were rained out. When it rained he drank;
when it was clear he worked, but drank at night.

Chester was married fourteen years, but stated that it was never
a happy marriage. He felt that it was convenient and was necessary for
the four children who resulted from the union. His wife filed the
divorce proceedings stating that she "wanted to live a little bit."

The court awarded Chester custody of the children who ranged in age from 13 to five years of age. Shortly after the divorce the wife moved back in to care for the children, but brought a boyfriend with her. Chester professed little displeasure at the situation, stating that he had no feelings for the woman, he needed help with the children, and that the man who moved in--Chester called him his husband-in-law--was a "good ol' boy."

Chester felt that drinking had caused him severe problems. He denied DT's, but said that he had experienced countless blackouts. He had great financial problems which he related directly to his drinking. He reported, almost proudly, that he had totally wrecked 15 cars. Significant personality changes were reported by Chester due to the influence of alcohol. He said that while drinking he could meet people, feel comfortable around his friends and, in general, just feel some relief from his worries. These are things that he said he could not do when he was sober. When questioned about his worries, he stated that he worried about everything. He could not elaborate on any specific worries. Chester did his drinking at home, and drank only beer. Chester clearly remembered his first drink.

Overall impression derived from the first interview was of an individual functioning at about the average level of intelligence with only fair educational preparation and extremely elevated levels of anxiety and depression. Psychological testing generally supported this impression.

Chester was eager to volunteer for the study, but required
reassurance that he could do all that was expected of him and that he
would not make a botch of things. His pretreatment MMPI profile was
27'0468' 35-19 F'L/K. This closely fit the GL Type II profile.

Alcoholic Treatment

The Alcoholic Treatment Service (ATS) at Southeast Louisiana
State Hospital is a tightly structured therapeutic community which uses
the total treatment approach to alcoholism. Each patient in the program
is required to participate in all of the treatment modalities available,
with the exception of medications which are, of course, individualized.
However, all patients are required to be maintained on disulfiram during
the entire program, plus five days before entering the program.

The hospital maintains a rural serenity and pace, in spite of
its close proximity to New Orleans. The ATS itself provides a rather
homey atmosphere, but not at the sacrifice of professional attention to
the whole person. Of particular note concerning the ATS staff is that
replacements in the nursing staff are prompted by retirement or reloca-
tion, not by dissatisfaction.

The ATS program is structured rather flexibly around a minimum
expected stay of 30 days. An incoming patient plugs into the ongoing
program; there are no discrete cycles. From seven in the morning until
seven in the evening every hour is scheduled and structured. Group
therapy, occupational therapy, muscle relaxation, lecture, Alcoholics
Anonymous, patient government meetings, family therapy and music
therapy are planned, with no variation, week to week. At any time the
patient knows in what activity he is scheduled to participate.
Procedure

Two separate sets of data, requiring separate analyses, were collected on both Paul and Chester. The first set was a broad group of psychological tests administered at the beginning and, again, at the end of the treatment program. This pretreatment and posttreatment battery was required in order to estimate measurable gross change over the period of treatment. The other set of data collected was the actual P-technique data and was collected twice a day, seven days a week for the entire treatment period. These data were concerned with measuring changes occurring within the period of treatment. The instruments used and the procedures followed in each data collection are set out below.

The pretreatment and posttreatment data consisted of the responses to the following tests being given upon entering the program and upon exiting the program. These particular tests were selected in order to get an estimate of general psychological functioning and, also, to allow significant changes in general, as well as specific, functioning to be seen. In all, 60 tests and subscales are represented in the battery. They cover most of the areas of general psychological functioning, such as intellection, the various memories, attitudes, specific personality traits, visual-motor tasks, functional self-reports, etc. Alternate forms were used where published.

(a) Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1943).

(b) Wechsler-Bellvue I (Wechsler, 1939).

(c) Wechsler Memory Scale I (Wechsler, 1945).

(d) Group Personality Projective Test (Cassel and Kahn, 1960).
(e) Sixteen PF (Form A) (Cattell, 1956).

(f) Benton Revised Visual Retention Test (Benton, 1963).

(g) Self-Evaluation Questionnaire-STAII-Form X2 (Spielberger, Gorsuch and Lushene, 1968).

(h) Guilford-Zimmermann Temperament Scale (Guilford and Zimmermann, 1949).

The data for the P-technique were collected at 10:45 AM and 3:45 PM daily. To reduce extraneous variation, only two people collected these measures. The physiological measures were pulse rate, respiration rate and systolic and diastolic blood pressures. To further reduce errors, the blood pressures were taken with the aid of a piece of electronic equipment (Pressurometer—a registered trademark—manufactured by Avionics Research Products, Model 1900). Applications of this equipment and the other physiological measures were routinized and adhered to by the two experimenters.

The two psychological measures were a) the Self-Evaluation Questionnaire STAI X-I (Spielberger, Gorsuch and Lushene, 1968), consisting of twenty statements dealing with how the patient felt at that moment (e.g. "I feel calm"; "I feel nervous"; "I feel self-confident"); and b) the Treatment Evaluation Form which was developed for this study based on Moos' (1969) and Price and Curlee-Salisbury's (1975) work on evaluation of patient-treatment interactions (Appendix I). Examples of this scale are: "I feel that the AM/PM activities were important to me"; "---were pleasant"; "---helped me to get well."

The order of completion was: the two pencil-and-paper tests and then the physiological measures. This order was chosen in order to
allow a fixed quiet time before taking the physiological measures. The same room was used on each occasion, and the same arm chair was used each time the blood pressure was taken in order to control the level of the arm and thereby reduce postural effects on the blood pressure readings.

Analysis Overview

The pretreatment and posttreatment data were collected and then scored by standard, published methods. The resulting scores were evaluated for significant changes from first to second administration. A response change was considered significant if it differed from its previous response level by as much as two standard errors of the measure.

Lead and lag interaction effects on all measures were explored by construction of a number of correlation matrices in which each of the major variables was advanced and retarded, in turn, by one and then two occasions while holding all the other variables constant. These numerous matrices were then compared, by a simple count method, for number of improved correlations.

The data intended for P-technique analysis were collected and subjected to several computerized procedures in order to evaluate meaningful changes that occurred during treatment. All of the computerized procedures were taken from the Statistical Analysis System data processing procedures (SAS*76, Barr, Goodnight, Sall and Helwig, 1976). The P-technique data were analyzed using SAS FACTOR, a principal axes factor analytic procedure. Varimax prerotation and Promax rotation were selected; no specific number of factors were selected; the smallest
admissible eigenvalue selected was 1; K was set equal to 3. The eigenvalues resulting from this procedure were subjected to a scree test, as described by Cattell (1953), and from that test the number of factors desired was stated when the SAS FACTOR procedure was re-run. The occasion values of each factor were computed using the SAS SCORE procedure, thereby creating a data set of occasion factor values. This data set was analyzed using the SAS STEPWISE regression procedure to determine the model of best fit for occasion factor values over time. This SAS STEPWISE procedure yielded predicted values which were then plotted over time.
RESULTS

Paul and Chester both stayed the recommended time in the treatment. They both fully participated in the study, also. Paul participated in the study 32 days, or 64 measurement occasions. Chester was in the study 37 days, or 73 measurement occasions. For the sake of clarity, the results will be presented by patient name.

Paul

Paul's principal therapist reported that Paul made an obvious, positive effort in his participation in all of the ATS activities. However, he never really fit in as "one of the crowd." His aloofness and intellectualizations were apparent to the members of his therapy group and they pounced upon these attitudes. The tenor of the group reports was that at Paul's departure from the group he was as distant and socially isolated as he was when he entered the group.

On the other hand, Paul commented frequently on how valuable the treatment was to him. However, he seemed to attribute most of his growth to the doctor and the other professional staff members, rather than to the group processes. On more than one occasion he referred to the group members as "a bunch of failures" or reported a great deal of amusement at their efforts to figure him (Paul) out.

The only special problem unrelated to the treatment that Paul referred to was his hypertension. He was on medication for this condition during the entire treatment. Interpretable changes were seen in
his systolic and diastolic blood pressures despite the medications.
Paul denied being overly concerned with anything back in New Orleans.
He said that he had money in the bank, his job waiting for him and no
family responsibilities to worry him. Paul maintained his extremely
self-confident attitude throughout his treatment.

**Paul: Pretreatment and Posttreatment Battery**

The report by Paul's therapist that he could see little meaningful change in Paul's functioning was well supported by the pretreatment and posttreatment test comparisons. Accepting two standard errors of the measure as a significant change resulted in only seven out of the 60 tests or subscales reflecting any change in Paul's psychological functioning. On five scales of the 16 PF test Paul's responses changed significantly. He appeared more outgoing and easy-going (Factor A); more expedient and feeling fewer obligations (Factor G); more tough-minded and self-reliant (Factor I); more shrewd, calculating and penetrating (Factor N); and more group dependent, more of a joiner (Factor Q2). His two other significant changes were on the Guilford-Zimmermann Temperament Survey on which he scored lower on the General Activity subscale and higher on the Restraint subscale. Using two SE's, one could reasonably expect three interpretations of significance in 60 applications, and although these seven changes seem to be along desirable lines and seem to make sense logically, the expected error should be considered.

**Paul: P-Technique**

The construction of the lead and lag matrices indicated that the
best temporal model for the P-technique analysis was the one when all the measures were considered from a simultaneous point of view, that is, without any lead or lag.

Seven factors were requested as output from the SAS FACTOR procedure with Paul's 64 measures of 31 variables. Several of the variables responded to by Paul showed extremely low variability in response; in fact, one variable, "The activities made me feel lonely," showed zero variability in response and, consequently, was dropped from the analysis. Of the seven obtained factors, three showed remarkable similarity to three others, and for increased meaningfulness, these pairs have been described and plotted together. The similarities noted were both due to high loadings on common variables and, primarily, due to an apparent functional similarity over time.

Factors I and II seem to be related to Paul's physical discernment of anxious discomfort. The highest loading variables are listed below, and the factor variations over time are plotted in Figure 1. They have been named Physical Anxiety.

<table>
<thead>
<tr>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am tense</td>
<td>Systolic blood pressure .86</td>
</tr>
<tr>
<td>I feel nervous</td>
<td>Diastolic blood pressure .84</td>
</tr>
<tr>
<td>I am worried</td>
<td>I feel anxious</td>
</tr>
<tr>
<td>I feel high-strung</td>
<td>I feel high-strung</td>
</tr>
<tr>
<td>I feel calm</td>
<td>I am tense</td>
</tr>
<tr>
<td>I am relaxed</td>
<td>I feel comfortable</td>
</tr>
<tr>
<td>I feel comfortable</td>
<td>I feel content</td>
</tr>
<tr>
<td>I feel content</td>
<td>I am relaxed</td>
</tr>
<tr>
<td></td>
<td>I feel calm</td>
</tr>
</tbody>
</table>

Regression analysis of both of these factors over time showed that the linear, quadratic, cubic and quartic components for measurement occasions provided the best model for describing the change in factor
Figure 1. Physical Anxiety Factors (Paul I & II).
strength as a function of the occasion number. The obtained curve suggests that the variables which comprise this curve, and appear to reflect some physical anxiety-like discomfort, showed a rapid reduction upon entering the treatment program and then elevated again slightly toward the middle of the program, then decreased again somewhat. The rapid descent of Factor II is possibly due to loading heavily on the blood pressures. When Paul entered the program, he was immediately placed on medication for this condition. Interestingly, Factor I does not have high loadings on blood pressure, but fluctuates quite closely with Factor II, leading it so to speak. The change over time indicates less of this factor involvement in Paul's functioning at the end of treatment compared with earlier stages of treatment.

Factor III appears to indicate Paul's degree of pleasure derived from the treatment activities. Factor III is plotted in Figure 2 and is named Treatment Enjoyment.

Factor III

The activities were pleasant to me .70
I feel at ease .70
I feel rested .68
The activities made me feel more lively .66
I feel content .64
I am tense -.45
I feel nervous -.46

The regression equation for this curve also required the first four power components in order to describe best the factors over occasions. As an indication of pleasure derived from the treatment, this curve indicates that the middle treatment period was not enjoyable. Also, it appears that the termination activities were not enjoyable.
Figure 2. Treatment Enjoyment Factor (Paul III).
Comparing first measure with final measure, this factor strength changed only slightly over the program, considering direction of curve termination. It will be seen on most of the curves to be presented that there are rather distinct phases in the patient's treatment perception as reflected by responses.

Factors IV and V seem to be an indication of Paul's evaluation of the therapeutic value of the treatment. These factors are plotted in Figure 3 and are named Treatment Evaluation.

<table>
<thead>
<tr>
<th>Factor IV</th>
<th>Factor V</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel pleasant</td>
<td>The activities were important</td>
</tr>
<tr>
<td>Pulse rate</td>
<td>to me</td>
</tr>
<tr>
<td>The activities made me</td>
<td>Pulse rate</td>
</tr>
<tr>
<td>feel more lively</td>
<td>.42</td>
</tr>
</tbody>
</table>

Quadratic, cubic and quartic components resulted in the plotted curves for Factor IV, while only a linear regression was required in describing Factor V. Both curves seem to indicate a distinct decline in Paul's responses to the variables which seem to be program evaluative in nature. Paul appeared to evaluate entrance into the program more highly than any of the subsequent activities. Throughout the treatment Paul's verbalizations of boredom, lack of challenge and how little was being done were noted by the investigators. Toward the end of his treatment he was almost constantly finding fault and making suggestions concerning how the program could be altered so that "the others could get more from the program." He was quick to state, however, that the weaknesses in the program did not affect him. The differences between first and last measures show considerable change in response values, with some slight increase in evaluation just before the program's end.
Figure 3. Treatment Evaluation Factors (Paul IV & V).
Factors VI and VII seem to suggest Paul's psychological anxiety-like discomfort. These factors are plotted in Figure 4 and are named Psychological Anxiety. Both factor curves represented in Figure 4 were derived from two-component regression models; the two components were linear and quadratic functions. To the extent that they do represent psychological anxiety--fearfulness, rumination, apprehensiveness--these curves suggest a general decrease in anxiety, with the lowest representation being found at mid-program.

<table>
<thead>
<tr>
<th>Factor VI</th>
<th>Factor VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel high strung</td>
<td>I am worried</td>
</tr>
<tr>
<td>.62</td>
<td>.67</td>
</tr>
<tr>
<td>I feel anxious</td>
<td>I feel high-strung</td>
</tr>
<tr>
<td>.56</td>
<td>.65</td>
</tr>
<tr>
<td>I feel upset</td>
<td>I feel nervous</td>
</tr>
<tr>
<td>.48</td>
<td>.50</td>
</tr>
<tr>
<td>I feel nervous</td>
<td>I feel anxious</td>
</tr>
<tr>
<td>.43</td>
<td>.44</td>
</tr>
</tbody>
</table>

Apparently, entrance into the program had some anxiety potential, as did departure from the program. During the middle phase Paul appeared to be rather complacent and relaxed. This was the attitude he verbalized also.

Chester

Reports from Chester's primary therapist indicated that Chester appeared to participate in the treatment activities in a whole-hearted fashion, but remained on the periphery of heated group discussions, deferred to the other group members in most group decisions and tried his best to keep things going smoothly. The other members of the group immediately became aware of his overly submissive nature and used a great deal of group time in working with this obvious problem. His domestic problem, his husband-in-law, was another problem that the group attacked. Chester's therapist felt that Chester made a great deal of
Figure 4. Psychological Anxiety Factors (Paul VI & VII).
progress in becoming more outspoken and, in general, seemed to value himself more highly, consequently becoming more comfortable in his social interactions.

Chester's evaluation of the group process was one of unmitigated agony at the outset; later on he verbalized seeing what the group had been trying to get him to see. His reports of treatment benefit dealt more with his peer interactions than with his contacts with the professional staff.

The most significant problems Chester had to contend with outside the treatment program revolved around his poor financial situation and the responsibility of rearing four children. Chester did manage to get relief assistance for his children, and toward the end of his treatment, he made the "husband-in-law" move out of his house. Before the end of the treatment, Chester also made arrangements to go to work operating heavy equipment. He seemed to be taking an active role in his life planning, although he was somewhat apprehensive about his future.

**Chester: Pretreatment and Posttreatment Battery**

As his behavior and therapist reports suggested, Chester also changed considerably in his measured functioning as shown by the pretreatment and posttreatment testing. He had 10 tests or subscales of the 60 which changed as greatly as 2 SE's. Although the Verbal Scale, Performance Scale, and the Full Scale of the Wechsler-Bellevue Intelligence Scale did not change, two subscales changed significantly, if not particularly meaningfully. Picture Arrangement went down; Picture Completion went up. Significant and meaningful changes occurred on the
MMPI—scales 2, 6, and F decreased markedly. Chester's overall memory functioning, as measured by the Wechsler Memory Scales, increased dramatically.

The 16 PF test indicated that Chester responded in a manner which suggested that he had become: less shy, restrained and timid (Factor H); more practical and more regulated by external realities (Factor M); more group dependent and more of a "joiner" (Factor Q2); but also that he had become more apprehensive, self-reproaching and troubled (Factor O).

Chester: P-technique

Based on the scree test, eight factors were requested of the SAS FACTOR procedure analysis of Chester's 74 measures on 32 variables. During interpretation of the obtained factors it again became apparent that there were three pairs of factors which were very similar by virtue of their variable loadings as well as by their functional variations over time. One of the resulting factors had few sizeable variable loadings and appeared to have little meaning; consequently it is not discussed here.

Lead and lag interactions in Chester's data were evaluated by the same strategy as was used with Paul's; again the best approach was deemed to be that of using simultaneously acquired data with no lead or lag.

Factors I and II seemed to reflect physiological awareness of anxious discomfort and were named Physical Anxiety. These factor fluctuations are plotted in Figure 5.
Factor Fluctuations in Standard Scores

Figure 5. Physical Anxiety Factors (Chester I & II).
Factor I

<table>
<thead>
<tr>
<th></th>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am jittery</td>
<td>.85</td>
<td>I am regretful</td>
</tr>
<tr>
<td>I feel nervous</td>
<td>.83</td>
<td>I feel over-excited and rattled</td>
</tr>
<tr>
<td>I am tense</td>
<td>.78</td>
<td>Systolic blood pressure</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>.45</td>
<td>I feel high-strung</td>
</tr>
<tr>
<td>I am worrying over possible misfortunes</td>
<td>.55</td>
<td>I feel upset</td>
</tr>
<tr>
<td>I feel calm</td>
<td>-.50</td>
<td>I feel jittery</td>
</tr>
<tr>
<td>I feel relaxed</td>
<td>-.57</td>
<td>I feel at ease</td>
</tr>
</tbody>
</table>

The regression equation for Factor I over time included quadratic, cubic and quartic components; quadratic and cubic components were utilized in describing Factor II over time. Considering the variables involved in the factor make-up, as well as the relative fluctuations represented in Figure 5, it appears that Factor II is the more subtle of the two factors and is possibly more endogenous. Chester's reported awareness of physical anxiety abated somewhat during the middle of treatment, but appeared to be increasing toward the end of treatment, at least on Factor II.

Factor III appears to plumb the dimension of treatment pleasantness. This factor was named Treatment Enjoyment and is plotted in Figure 6.

Factor III

| The activities were pleasant | .71 |
| Diastolic blood pressure    | .48 |
| I am relaxed                | .46 |
| I feel at ease              | .41 |
| I feel high-strung          | -.45 |
| I am worrying over possible misfortunes | -.59 |
| The activities made me feel lonely | -.73 |
| The activities made me feel uneasy | -.75 |

This rather complex line shown in Figure 6 required a regression equation with linear, quadratic, cubic and quartic components.
Factor Fluctuations in Standard Scores

Figure 6. Treatment Enjoyment Factor (Chester III).
Treatment Enjoyment, as inferred from Chester's responses, had several phases for Chester. His initial positive perception rapidly became very negative, then became more positive, with a slump beginning about mid-point. At about the middle of his treatment Chester began verbalizing how he was beginning to feel like a part of a group for the first time in his life. The latter one-third of the program he voiced the need to leave the program so that he could provide for his children. This drive may account for the observed deterioration in this factor in the latter phase of treatment.

Factors IV and V seem to strongly suggest a therapy evaluation set. These factors are plotted in Figure 7 and are named Therapy Evaluation.

<table>
<thead>
<tr>
<th>Factor IV</th>
<th>Factor V</th>
</tr>
</thead>
<tbody>
<tr>
<td>The activities helped me to get well</td>
<td>I talked freely and openly</td>
</tr>
<tr>
<td></td>
<td>People were friendly to me</td>
</tr>
<tr>
<td>The activities were important to me</td>
<td></td>
</tr>
<tr>
<td>The activities made me feel more lively</td>
<td></td>
</tr>
<tr>
<td>I feel self-confident</td>
<td></td>
</tr>
<tr>
<td>I feel anxious</td>
<td></td>
</tr>
<tr>
<td>I am worrying over possible miscortunes</td>
<td></td>
</tr>
<tr>
<td>I feel joyful</td>
<td></td>
</tr>
</tbody>
</table>

The curve representing Factor IV's variation over time results from a regression equation containing linear, quadratic and cubic components. The plotting of Factor V involved linear, quadratic, cubic and quartic components in its regression equation. Considered as Chester's Therapy Evaluation factor, these plottings suggest that his final evaluation of the program differed from his initial evaluation. Again there were recognizable phases in Chester's reports, with an
Figure 7. Treatment Evaluation Factors (Chester IV & V).
abrupt rise in his evaluation during the early stages of treatment, a
deterioration beginning at about the quarter-point of the program, then
a positive evaluation during the last quarter.

Factors VI and VII appear to represent a dimension of Psychological Anxiety and are plotted in Figure 8. The variables which are involved in this factor deal with reported feelings of discomfort without a great deal of physical involvement, especially on Factor VI which is the better defined of the two. Both of these Psychological Anxiety factors increased steadily over the course of the treatment. Chester reported and was observed to be taking more responsibility for his life over the course of the treatment, and he became increasingly aware of the problems confronting him which he would have to face without alcohol-induced respites. These considerations may explain the steady increase in psychological discomfort. Before going to treatment he denied most of his cares and appeared to be complacent in his renunciation of his masculine role in life. In Chester's case, possibly increased anxiety had to be expected as a concomitant with his re-entry into a responsible style of life.

<table>
<thead>
<tr>
<th>Factor VI</th>
<th>Factor VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel high-strung</td>
<td>I feel upset</td>
</tr>
<tr>
<td>I feel upset</td>
<td>I feel high-strung</td>
</tr>
<tr>
<td>I am jittery</td>
<td>I feel calm</td>
</tr>
<tr>
<td>I am tense</td>
<td>I feel joyful</td>
</tr>
<tr>
<td>I feel nervous</td>
<td>The activities were</td>
</tr>
<tr>
<td>Activities made me</td>
<td>pleasant</td>
</tr>
<tr>
<td>feel uneasy</td>
<td>Respiration rate</td>
</tr>
<tr>
<td>I feel comfortable</td>
<td>Pulse rate</td>
</tr>
<tr>
<td>I feel rested</td>
<td>-.75</td>
</tr>
<tr>
<td>I feel relaxed</td>
<td>-.76</td>
</tr>
<tr>
<td>I feel content</td>
<td>-.85</td>
</tr>
<tr>
<td>I feel pleasant</td>
<td>-.86</td>
</tr>
</tbody>
</table>
Figure 8. Psychological Anxiety Factors (Chester VI & VII).
P-Technique: General

The administration of this P-technique study caused few problems in the ongoing treatment program, and those few problems were mainly of a timing nature and were readily solved. The physiological measures required only minimal additional time and inconvenience. Once the routine is established, the measures seemingly could be taken by aides or assistants. In a larger ward setting a longitudinal study of this sort could be conducted without having total staff involvement, as this study had. The patient participants appeared to enjoy the procedure, particularly the blood pressure measures. Also, no problems were encountered by the attitudes of the nonparticipating patients.

As the curves presented above indicate, twice-daily changes are measurable, not random—as all curves shown were significant at $P=0.05$ or better—and conform rather well to observer reports. These curves were derived from the fluctuations of variable responses along factor dimensions which were tentatively identified as Physical Anxiety, Treatment Enjoyment, Treatment Evaluation and Psychological Anxiety.
DISCUSSION

The above-stated results, although based on only two subjects, clearly answer some questions, do not answer other questions and, as most research seems to do, raise some new questions. Additionally, some tentative conclusions can be drawn concerning the obtained results.

Addressing the first major question of the study, "Is the P-technique method of longitudinal investigation an appropriate tool for use in structured, ongoing treatment programs?", the answer is clearly in the affirmative. As a matter of operating procedure, the data collecting process can fit smoothly into a treatment process, depending considerably, of course, on the selected variables. Only minimal inconvenience to the staff at Southeast Louisiana State Hospital was reported or observed during this study. And this was the result, partly, of cramped quarters to begin with, a temporary understaffing and a very tightly structured treatment program. It appears that the P-technique can be readily applied to almost any conceivable treatment system.

The other major question dealt with whether or not recognizable and meaningful differences between different alcoholic types could be obtained by analyzing a number of variables over time. Very definitely the differences between the two were recognizable. Meaningful? The real meaning of the differences will become better known only when a number of P-technique studies have been done with the alcoholic population. However, it is possible to compare and contrast the factor plots
presented earlier if one bears firmly in mind that the factors, and their plots, are abstractions derived from a very limited population of variables and do not graphically describe any highly definable human function. As will be seen, however, the four resulting factor dimensions—Physical Anxiety, Psychological Anxiety, Treatment Enjoyment, and Treatment Evaluation—which evolved and were interpreted from the factor solutions for each man were comparable statistically and appeared to be highly concordant between the men. So even though there are only two subjects, certain comparisons seem justified between the resulting factors.

The two subjects of this investigation were quite different based on MMPI selection, not too different based on age, presenting problem, and again, they were very different when life experiences—education, jobs, socio-economic variables, social experiences—were considered. The finding of some factor similarities between these two very different men would suggest that the P-technique factors, while specifying different response sets, are also capable of illustrating response similarities. This is important, for if all derived plots were widely different, the value of P-technique studies would be greatly diminished due to the impossibility of making generalizations beyond the individual studied. Of course, many P-technique replications would be required before any strong generalizations would be in order. Below are observations concerning the similarities and the differences in the obtained plots, with some speculative interpretations and conclusions.

**Treatment Enjoyment**

The fluctuations of the two factors which seemed to best evaluate Treatment Enjoyment (Paul III and Chester III) are plotted in Figure 9.
Figure 9. Comparison of Treatment Enjoyment over time. Paul Factor III and Chester III.
The equivalency of these two factors was tested by Kendall's coefficient of concordance, W, (Kendall, 1948). The variables composing Paul Factor III were ranked and then compared with the ranked order of all of Chester's Factor III variables. The concordance of these two factors was .81; an F test for significance was done and this value was found to be significant at a probability of less than .01. As an additional test of the equivalency of these two factors, a test of congruence as described by Burt (1952) was conducted. The resulting coefficient of congruence was .58 and was significant at the .01 level.

In terms of response to treatment, it is readily apparent from Figure II that these two men had strongly different appraisals of the enjoyability of the treatment program. Paul's initial impression was low but rapidly became more positive, then softened in the middle of treatment. Chester's impression of the enjoyability of treatment was at nearly all times 180 degrees out of phase with Paul's impression.

If this finding of radically opposed assessments of enjoyability should be replicated, it could lend support to program modification so as to keep those patients in treatment who might drop out. For instance, the introduction of some different stimulus—experience, treatment modality, etc.—during the middle phase of treatment could possibly reverse the distinct mid-treatment valley in Paul's curve. Of course, replication with follow-up studies could be required to determine whether these are typical, group-representative curves and, further, whether these are "good" curves for treatment or "bad" curves. Possibly, treatment should not be enjoyable.
Treatment Evaluation

The factors which were named Treatment Evaluation are plotted in Figure 10. The ranks of the variables that comprised these factors were concordant to the extent that Kendall's \( W \) was .68. This was significant beyond the .05 level of significance. Burt's congruence coefficient was .47. This was significant at .01.

Paul's responses suggested a linear decrease in his evaluation of the therapeutic value of the program. Chester, on the other hand, responded to the same variables in a more complex, possibly more truly evaluative manner, than Paul. Apparently, Paul decided quite early that the program had little to offer him, and this idea intensified over the treatment period. His verbalizations reflected this interpretation rather well.

Chester's responses suggest that when his Treatment Enjoyment factor was low, (Figure 9), his Treatment Evaluation factor was high. Possibly Chester perceived some connection of discomfort with therapeutic value, some penance, as it were.

Except for the termination phase, Paul's Psychological Anxiety Curve (Figure 12) is not too different from his Treatment Evaluation curve; as anxiety decreased so did treatment evaluation.

Physical Anxiety

A comparison of the resulting Physical Anxiety factors is presented in Figure 11. Kendall's coefficient of concordance was .90; this is a significant concordance, considerably less than .01 probability. Burt's coefficient of congruence was found to be .61. This was also significant at the .01 level.
Figure 10. Comparison Treatment Evaluation Factors over time. Paul Factor IV and Chester Factor IV.
Figure 11. Comparison of Physical Anxiety Factors over time, Paul Factor II and Chester Factor II.
The difference in magnitude is one of the most striking points in this comparison. Paul's blood pressure, though responding well to medication, did fluctuate considerably and both pressures were highly loaded variables in his Physical Anxiety factor structure. Also, he was finely attuned to the status of his hypertension, possibly heightening his awareness of bodily changes and his responses. Chester had no physical complaints, took no medication and, based on his responses, had little awareness of physical changes.

These plots appear to shed little light on differential responses to treatment. Possibly if more physiological measures had been involved and different physiological functions measured—G.S.R., E.M.G., salivary pH, urinalysis, etc.—more interpretable curves would have resulted.

**Psychological Anxiety**

The two curves plotted in Figure 12 represent the factor fluctuations over time of the principal Psychological Anxiety factors (Paul VI and Chester VI). Evaluation of the concordance of the composition of these two factors was made by Kendall's W and was found to be .78. This was significant at a probability of less than .01. Burt's congruence estimate was found to be .41. This was significant at the .05 level.

The comparison of these two factors' changes over time is interesting in that Chester's Psychological Anxiety increased linearly over the treatment time, while Paul's Psychological Anxiety started high but reached a low point at about two-thirds through the program, then
Factor Fluctuations in Standard Scores

Factor 12. Comparison of Psychological Anxiety Factors over time
Paul Factor VI and Chester VI.
started increasing again. One interpretation that could be offered is that Paul achieved a certain psychological calmness within the temporal limits of the treatment program that did not exist at the two extremes—coming and going. Chester's anxiety grew steadily, possibly due to his taking control of his own destiny and his lack of experience in that role. The "proper" levels of anxiety for these two personality types to achieve change in behavior are subjects for follow-up and replication studies.

The comparatively simple structure of these two curves suggests that these psychological anxiety-like responses are cumulative responses rather than rapidly expressed reactive responses. If this observation should hold up through replication, these may be the most easily measured and most suggestive of overall treatment effects. If, for example, a linear increase in psychological anxiety is obtained repeatedly with alcoholic sub-types comparable with Chester and this is found to be indicative of therapeutic change, then finding a decrease in this sub-type would suggest no growth or improvement is occurring.

Another interesting observation is that Paul's lowest point on Psychological Anxiety occurs at the same point in the program as his big decline in Treatment Enjoyment (Figure 9) and differs from his Physical Anxiety plotting (Figure 11) in complexity, direction and overall change.

It appears that these patients differed in their responses to treatment in measurable and, to some degree, interpretable manners. On highly concordant dimensions, differences were seen in complexity,
direction and magnitude in the responses given by these two men. The
two factors which seem to be the most intriguing in relation to treatment-
patient matching are the Treatment Evaluation factors and the Psychological
Anxiety factors. Relatively speaking, these are the more simply
constructed lines, and they seem to illustrate response differences more
clearly. The nearly completely opposite response curves in the Treat-
ment Enjoyment dimension appear to have some meaning that should be
further explored.

These comparisons and contrasts between these two patients' factor plots are interesting, and hopefully they will be more meaningful
when others are collected. By themselves, these plots on two subjects
can give little in the way of treatment implications or treatment recom-
mendations for the different types of alcoholics. That these plots
have interpretability, though limited, is important. The true worth of
this study will depend on the replication of similar P-techniques with
alcoholic populations, in order to determine what is a "good" or a "bad"
curve for a particular type alcoholic. It must also be determined what
these curves mean regarding desirable patient-treatment matches. The
P-technique appears to be a valuable tool in determining these matches.

Future workers in the area of P-technique analyses of patients
in treatment would be well advised to pay particular attention to
variable selection and scaling procedures. It became apparent while
conducting this study that response sets and individual interpretations
of variable meaning are entirely different between widely divergent
types of patients such as those who participated in this study. Small
response changes by an encapsulated individual such as Paul appear to
have very different meanings than relatively large response changes by a more flexible individual such as Chester. Also, multi-modal dimensions of response categories, such as peer reports, interview evaluations, staff reports, to name only a few, should be included in order to offset the self-conscious aspects of self-report.
REFERENCES


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APPENDIX
| DIRECTIONS: Please answer these questions as you felt during the past session. Circle your answer. |
|---------------------------------------------------------------|----------------|
| I feel that the AM/PM activities . . .                       | 1 2 3 4 |
| 1) were important to me . . . . . . . . . . . . . . .          | 1 2 3 4 |
| 2) were pleasant . . . . . . . . . . . . . . . . .               | 1 2 3 4 |
| 3) made me feel more lively . . . . . . . . . . .             | 1 2 3 4 |
| 4) made me feel lonely . . . . . . . . . . . . . .               | 1 2 3 4 |
| 5) made me feel uneasy . . . . . . . . . . . . . .             | 1 2 3 4 |
| 6) helped me to get well . . . . . . . . . . . . .             | 1 2 3 4 |
| During the AM/PM session . . .                               | 1 2 3 4 |
| 7) people were friendly to me . . . . . . . . . . . .          | 1 2 3 4 |
| 8) I talked freely and openly . . . . . . . . . . .            | 1 2 3 4 |
VITA

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