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ABSTRACT

The authors attempt to locate predictor variables associated with the outcome of alcoholic treatment programs. Muscia's study focuses on the predictive potential of: (1) response to a GSR conditioning procedure; (2) several personality variables; and (3) age and IQ measures. Nine variables, reflecting diverse perspectives, were selected as a basis for assessing response to treatment. Data was collected on 41 subjects. A composite measure of improvement was established via factor analysis and a stepwise multiple correlation used to determine if the predictors were related to it. They were found to be not very effective. Bowen's study analyzed the relationship of long-standing variables (e.g. birth order, family size, etc.) and more recent social functioning variables (e.g. arrests, marital status, etc.) with post treatment functioning. The best predictors of future functioning were those variables which measured recent social functioning. Implications for client selection and treatment planning are discussed. Goldstein administered the Halstead Neuropsychological Battery to 53 sober but chronic alcoholics, who were then rated on degree of impairment. No correlation was found between this impairment rating and alcoholic treatment outcome, based on follow-ups of 40 subjects. (TL)

PREDICTING THE IN-HOSPITAL RESPONSIVENESS TO TREATMENT OF ALCOHOLICS

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The present study represents a portion of a broader, ongoing project which is attempting to examine the relationships among: 1) measures gathered at the time an alcoholic is admitted to the hospital for treatment, 2) assessed improvement in his status, measured just prior to his discharge from the hospital, and 3) indices of post-hospital adjustment. Within this framework, the investigation at hand represents an attempt to realte certain pre-treatment variables (predictor or independent variables) to measures of change or improvement (criterion or depedent variables) gathered just after participation in a treatment program with a human relations orientation. The use of in-hospital measures of improvement is rare to this literature. Of the studies reviewed only the work of Ludwig (1967) seems to have included pre-discharge measures of adjustment, represented by the California Psychological Inventory and the Psychiatric Evaluation Profile (and he got negative results). As such it was hoped that the pre-discharge measures of the present study would provide a vital link between measures gathered at the time of admission and during post-hospitalization follow-up. In this context, the purpose of the present study was to attempt to discover predictor variables, which when examined at the time an alcoholic presents himself to the hospital will permit a judgment pertaining to his relative in-hospital responsiveness to treatment.

The original design of the study called for relating seven predictor variables to nine criterion measures of change or improvement. (It was later decided to generate a composite measure of improvement based on the factoring of the criterion variables).

The available time permits only a brief discussion of the rationale and development of the measures, but a more extensive presentation may be found elsewhere (Mascia, 1969). The first three predictor variables were provided by a GSR conditioning procedure which was also used in an attempt to replicate the work of another investigator (Vogel, 1960, 1961). The conditioning procedure provided the measures of: acquisition, %CR (the percentage of CRs during the acquisition phase), and extinction. An illustrative conditioning record may be found in Figure 1. The personality variables of extraversion and neuroticism (provided by the E and N Scales of the Eysenck Personality Inventory), age, and an IQ measure made up the remaining predictor variables.

It was considered desirable to obtain a variety of response-to-treatment measures representing a range of psychometric sophistication (at times sacrificing psychological incisiveness), but posessing the advantages of reflecting the perspectives of different points of view, i.e., nurse, psychologist, and factor analyst, and varying degrees of globality, e.g., ratings of amount of improvement in contrast to factor scores. In considering the coarseness of some of the measures, it is pertinent to emphasize Shontz's (1965) suggestion that a highly refined measure may be inappropriate for assessing a global and complex phenomenon (such as responsiveness to treatment); that in its precision a highly refined measure may fail to capture important molar features of the phenomenon under consideration. Surprisingly, the anticipated coarseness of some of the measures turned out not to be a serious problem.

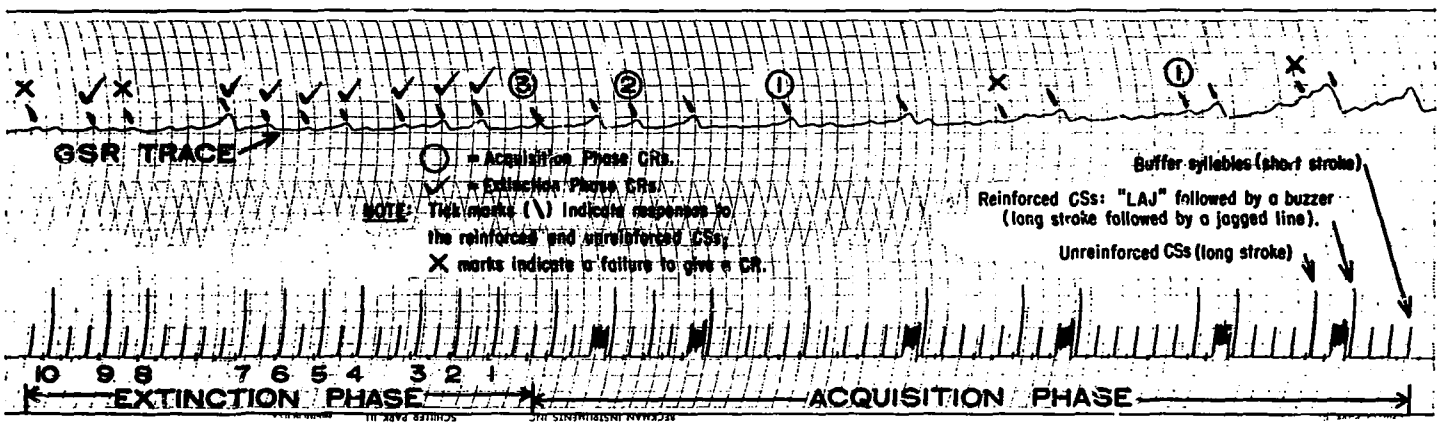

Fig. 1. An illustrative conditioning record (read from right to left).

With these considerations in mind, the original nine criterion variables were: a nurse's rating of improvement; three ratings of change provided by two psychologists who examined pre- and post-treatment MMPI profiles (i.e., More Uncomfortable-More Comfortable, More Socially Disruptive-More Socially Conforming, and Less "Healthy"-More "Healthy"); a score, Σd^2, obtained by taking for each MMPI scale the difference between pre- and post-testing in T score points, squaring each difference, and summing across the 14 MMPI scales utilized; and four factor scores (W, X, Y, and Z) derived from factoring MMPI residuals. The last four measures are perhaps deserving of a little clarification since they were developed in an attempt to introduce some psychometric refinement to the use of pre-post MMPIs in evaluating response to treatment.

In general, the statistical handling of change measures is replete with pitfalls, the elaboration of which is beyond the purpose of this report. Suffice it to say that the influence of the first testing, mean regression, and the reliabilities of the test and the difference scores are important considerations. In an attempt to avoid these and other statistical difficulties, factor scores were utilized. These scores were based on the factor analyses of the residuals derived from correlating the pre-testing with the post-testing results for each of the 14 MMPI scales used (K corrected T scores were used throughout). The mean pre- and post-treatment MMPI profiles are portrayed in Figure 2. These profiles are merely presented as a graphic aid, recognizing that they suffer from the shortcomings of means in general. Still it can be seen that the post-treatment profile generally represents a reduction in the intensity of

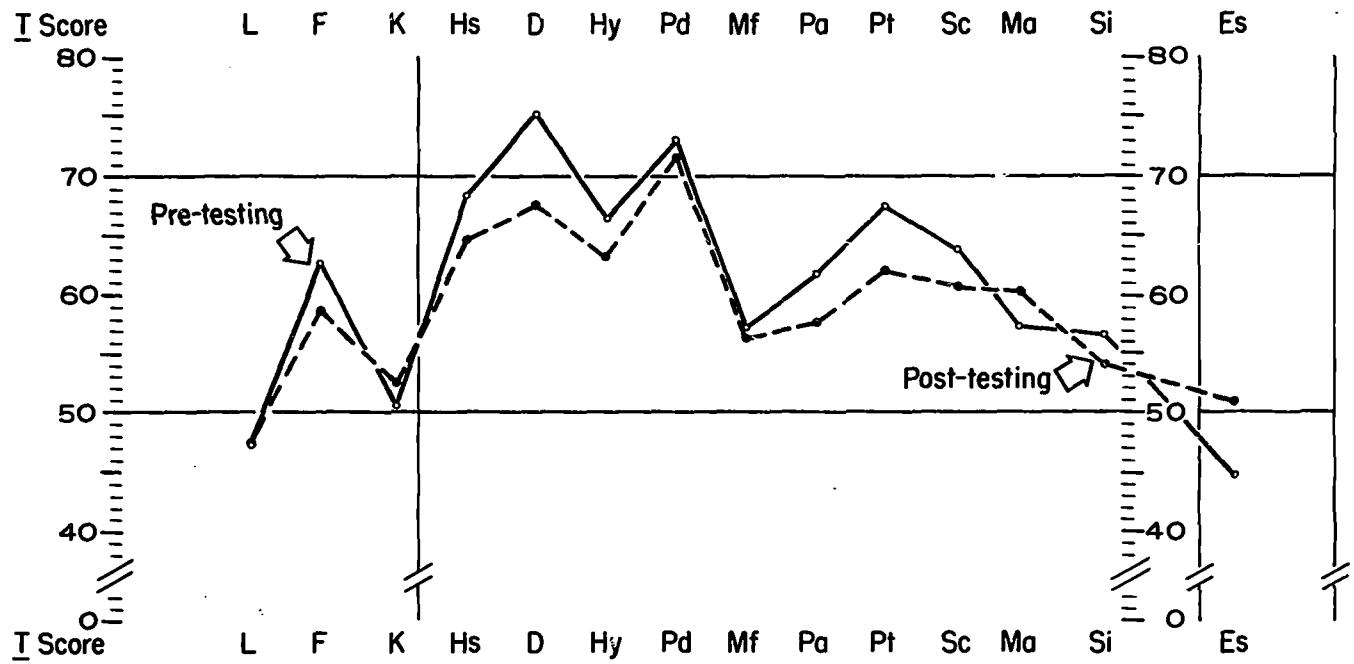

Fig. 2. Profiles representing mean MMPI scale scores on pre- and post-testing.

symptomatology. There are only three scales which are higher on post-testing, i.e., K, Ma, and Es, and these elevations can be interpreted as being consistent with improvement in alcoholic patients. It will also be observed that the shapes of the two profiles are very similar, suggesting that the post-profile might be predictable from the pre-profile. Indeed, an examination of Table 1 reveals that the correlations between the pre- and post-test scores for each of the 14 MMPI scales tend to be high, all r's being significant well beyond the .01 level. Thus, by knowing that the Ss as a group, tended to improve and also knowing that post-testing performance can be predicted from pre-testing, we can with relative confidence capitalize on the residuals in an attempt to assess an individual's change relative to the group's performance on each of the MMPI scales. Now, if it is recalled that a Residual= (Observed Value) - (Predicted Value) the sign of the residual can be used to assess the direction of an S's change on a particular scale (increased or decreased symptomatology) compared to the group as a whole and the size of the residual will indicate the amount of change. Thus if the predicted value (based on the group correlation) is larger than the observed value (i.e., the post-testing) the residual will be negative, and it means that for that MMPI scale the individual dropped (i.e., reduced symptomatology) on post-testing a greater amount than would have been predicted from the correlation between pre- and post-testing. Therefore, negative residuals tend to represent a relatively greater reduction in the intensity of symptomatology.

Table 1

Correlations Between Pre- and Post-MMPI Values for Each of the 14 Scales Utilized. The Raw Data Consisted of K Corrected T Scores; N = 48 Ss who Completed Treatment

MMPI Scale	Correlation
L	.554
F	.649
K	.808
Hs	.821
D	.731
Hy	.754
Pd	.672
Mf	.768
Pa	.523
Pt	.710
Sc	.823
Ma	.598
Si	.854
Es	.746

Note.--All the values are significant well beyond the .01 level. For 46 df an r of about .335 is required for a one-tail test of significance at the .01 level.

Similarly, if the residual is positive it means that the observed value at the time of post-testing on a particular scale is higher than would have been expected from the group's correlation of pre- with post-testing for that scale and it means that relative to the group, the individual did not reduce but increased the intensity of symptomatology represented by the scale. Therefore, positive residuals usually represent relatively increased symptomatology. (This generalization about the meaning of the sign of the residual will tend to hold for all scales except the Es scale, which in clinical practice is interpreted differently, i.e., an elevation on Es is typically associated with health rather than pathology. Therefore, for the Es scale a positive residual represents relative improvement, while a negative residual represents relative deterioration.)

The next step required that the residuals be factored in an attempt to: 1) see if they would combine in meaningful ways; 2) reduce the 14 variables to a smaller number of factors; 3) assess the psychological meaningfulness of the factors, i.e., to construe the residual change factors as measures of improvement. If these three goals could be accomplished, a factor score could be estimated for each S on each factor.

The four rotated factors that were obtained are presented in Table 2; they are labeled W, X, Y, and Z for convenience. For ease of examination the variables have been ordered according to the size of the factor loadings and factor loadings of .25 and under have been omitted. If we focus on those variables that have loadings of .60 and above some very

Table 2

Rotated Alpha Factor Loadings of MMPI Residual Change Scores

MMPI Scale	W	X	Y	Z
Pt	.84			
Hs	.83			
Sc	.79			
Pd	.69			
Es	-.65	-.37	-.35	
Hy	.61	-.32	.32	
K		-.61	-.35	-.28
F	.43	.60		.26
Si			.82	
D	.51		.64	
Mf				.66
Pa	.52			.64
Ma	.30	.29		
L		-.46		
Percent of Original Variance	29.62	9.89	11.41	7.97

Note.--All factor loadings of .25 and under have been omitted and the variables have been ordered according to the size of the factor loadings. The block effect has been added for emphasis.

interesting groupings emerge. For factor W the residual change scores of the Pt, Hs, Sc, Pd, Es, and Hy scales form an impressive grouping. The negative sign on the Es scale factor loading indicates that this variable is at the opposite end of the vector from the other variables; this is consistent with the scoring and interpretation of the Es scale which is usually the reverse of the other scales, i.e., scale elevations are usually associated with "pathology" whereas Es elevations are generally associated with "health." The composition and structure of this factor suggests, for this group of alcoholics, relatively "healthy" changes toward a greater sense of personal comfort, reduced reliance on somatization and physical complaints as important features of the life style, a reduction in the presence of unusual thoughts, better personality integration, and a reduction in asocial, psychopathic tendencies. (The mean pre- and post-MMPI profiles, Figure 2, revealed that all of these scales changed in the direction of decreased symptomatology.)

Factor X emphasizes the importance of the validity scales K and F and suggests a tendency toward relative change in the defensive and/or test taking style. These relative changes would be characterized in one direction by heightened self-esteem, an improvement in the social facade in an attempt to make a good impression on the world, feelings of self-reliance, and confidence in one's ability to cope with difficulties without receiving help from others.

Factor Y is characterized by a relative reduction or increase in depression, irritability, and tension, with a movement into the social world and the concomitant acceptance of others.

Factor Z appears to be dominated by a reduction or increase in passivity, anger, the tendency to blame others for one's difficulties, and an acceptance of personal responsibility.

While the configurations of change represented by these factors appear to represent varieties of relative clinical improvement, validation for the interpretations offered should rest on an examination of the residuals provided by individual Ss, i.e., an S who loads heavily on a particular factor should tend to demonstrate the kinds of residual changes which were described above for the factor in question. Factor scores were therefore estimated for all Ss on each factor in an attempt to assess the individual's changes on the variables heavily represented in each of the factors. These factor scores, which have a mean of zero and a standard deviation of one, are of positive or negative sign to represent different ends of the vector. An examination of the factor scores revealed that they did indeed represent changes on the residuals of the variables which were heavily loaded on the factors (and as it turned out, the residual changes were similar to the differences in T scores from pre- to post-testing). However, for all four sets of factor scores the negatively signed values appeared to be associated with clinical improvement or a reduction in the intensity of the symptomatology represented by the MMPI scales under consideration. Positively signed factor scores on the other hand seemed associated with a lesser degree of improvement or even deterioration. Therefore, for ease of conceptualization the signs of the factor scores were reversed so that a positive sign was representative of relative improvement.

By way of a review, a summary of the predictor and criterion variables is presented in Table 3. (The intercorrelations among the criterion variables are found in Table 4.)

Of the 48 male Ss that completed treatment seven failed to meet the criterion for acquisition on the conditioning procedure. Therefore, the principal statistical analyses reported will be based on an N of 41. (The results for an N of 48 with one less predictor variable, acquisition, are essentially the same as those for 41 Ss using all the predictors. Also, t tests failed to reveal significant differences between the Ss that conditioned and the Ss that failed to condition on any of the variables, except for variables two and three, %CR and extinction, which indicates, as might be expected, that as a group those Ss who did not condition revealed a propensity for a lower level of performance on other measures of GSR conditioning.)

Canonical correlation was used to relate the seven predictor variables to the nine criterion variables. The resulting Rc16-41 of .785 was statistically significant ($p<.01$). The results of this analysis are summarized in Table 5. At first glance this finding is rather encouraging. It suggests that a reasonably powerful prediction equation could be written which could be used to predict the potential responsiveness to treatment of all new patients who conditioned. The whole thing was too good to be true; things like this just don't happen in the clinical realm. In fact, I was so impressed that I became suspicious and as fate would have it a closer look at Table 5 revealed a much more complicated situation.

Table 3

Summary of the Predictor and Criterion Variables

Variable No.	Predictor Variables
1.	Acquisition
2.	%CR
3.	Extinction
4.	E Scale (extraversion)
5.	N Scale (neuroticism)
6.	Age
7.	IQ
	Criterion Variables
8.	Nurse's Rating: Amount of Improvement
9.	More Uncomfortable - More Comfortable
10.	More Socially Disruptive - More Socially Conforming
11.	Less "Healthy" - More "Healthy"
12.	Σd^2
13.	Factor Score W
14.	Factor Score X
15.	Factor Score Y
16.	Factor Score Z

Table 4

Intercorrelations Among the Nine Criterion Variables for the 41 Ss who Conditioned and Completed Treatment

Variables		8	9	10	11	12	13	14	15
Nurse's Rating: Amount of Improvement	8								
More Uncomfortable-More Comfortable	9	225							
More Soc. Disruptive-More Soc. Conforming	10	206	281*						
Less "Healthy"-More "Healthy"	11	234	652**	810**					
Σd^2	12	156	384**	594**	519**				
Factor Score W	13	353*	695**	607**	761**	448**			
Factor Score X	14	-129	-075	369**	254	498**	098		
Factor Score Y	15	246	365**	-175	-022	-146	082	-112	
Factor Score Z	16	213	060	380**	371**	338*	148	070	-001

N = 41, df = 39
* p<.05, one-tail test
** p<.01, one-tail test

Table 5

Summary Table for Canonical Correlation, Rc16-41,

Based on Seven Predictor Variables, Nine Criterion

Variables, and 41 Ss

Rc16-41 = .785
Lambda = .065
Chi Square = 91.813
df = 63
p = <.01

Predictor Variables		Canonical Weights	Canonical Weights		Criterion Variables
Acquisition	1.	-0.0603	0.7868	8.	Nurse's Rating: Amount of Improvement
%CR	2.	-0.5646	1.2408	9.	More Uncomfortable - More Comfortable
Extinction	3.	-0.6713	1.2414	10.	More Soc. Disruptive - More Soc. Conforming
E Scale	4.	-0.6451	-1.1029	11.	Less "Healthy" - More "Healthy"
N Scale	5.	-0.1201	-0.3577	12.	Σd^2
Age	6.	-0.0935	-1.2145	13.	Factor Score W
IQ	7.	0.0103	0.4630	14.	Factor Score X
			-0.4149	15.	Factor Score Y
			0.2737	16.	Factor Score Z

There it will be observed that the canonical weights for the criterion variables are of mixed signs, five are positive and four are negative. This is conceptually inconsistent with what we know of the intercorrelations among the criterion variables (Table 4). For instance the canonical weights for variables 10 and 11 are 1.2414 and -1.1029, respectively (Table 5), yet the correlation between variables 10 and 11 is .810 (Table 4). The mixed signs among the criterion variables' canonical weights suggest that the composite score for the criterion variables generated by the canonical correlation may not represent a psychologically meaningful estimate of improvement, as was intended. This, indeed, turned out to be the case. When the composite criterion scores were computed and then correlated with the original criterion variables the correlations turned out to be low and several of them were in the wrong direction. It was clear that the composite criterion scores did not adequately represent the nine criterion variables as a measure of improvement. Thus, canonical correlation in yielding the best linear combination between the predictor and criterion variables failed to make good psychological sense; the meaning of the predictions derived from this canonical correlation would be ambiguous - a very disappointing state of affairs which we are still trying to understand.

Having found that the results obtained from the canonical analysis were psychologically meaningless, it was decided to arrive at a composite criterion measure of improvement through factor analysis. Thus, the values of the nine criterion variables on the 48 Ss who completed treatment were factored and yielded the three factors which appear in Table 6. The factor

Table 6

Principal Components Loadings of Nine Criterion Variables; N=48 Ss who Completed Treatment

Criterion Variables	Factors I	II	III
8. Nurse's Rating: Amount of Improvement	.37	.45	.48
9. More Uncomfortable-More Comfortable	.67	.53	-.29
10. More Soc. Disruptive-More Soc. Conforming	.83	-.32	.04
11. Less "Healthy" - More "Healthy"	.92	.00	-.08
12. Σd^2	.74	-.31	.04
13. Factor Score W	.82	.26	-.30
14. Factor Score X	.29	-.62	-.09
15. Factor Score Y	.03	.66	.23
16. Factor Score Z	.38	-.22	.77
Percent of Original Variance	39.47	17.83	11.81

loadings of the first factor represent the correlation of each criterion variable with the factor. An examination of these factor loadings suggests that a factor score derived from the first factor would represent a reasonable composite measure of the criterion variables, with the influence of variables 11, 10, 13, 12, and 9 being emphasized. Factor scores were, therefore, derived from the first factor and used as a composite criterion measure; it was numbered as criterion variable 17 and simply called Improvement.

Having established a composite measure of improvement (which was felt to be much more representative than was provided earlier by canonical analysis), the task remained to determine if the present set of predictors were related to it. This was accomplished through stepwise multiple correlation with an F level for inclusion of .01 and an F level for deletion of .005. These are very generous limits and would exclude only the most noncontributory predictor variables.

The stepwise multiple correlation between the seven predictor variables and criterion variable 17, Improvement, utilizing the 41 Ss who conditioned, ran the full seven steps and at no point in the procedure yielded a statistically significant combination of predictors. The final R was .465. On examining the correlation matrix provided by the computer output for individual predictor variables that might correlate with Improvement, it was discovered that the r between age and Improvement was -.278, $p<.05$ (one-tail test). While statistically significant, this correlation has very little predictive power. From these results it might be concluded that

the present set of predictor variables is not very effective in predicting a composite measure of improvement which is based on the factoring of the nine criterion variables.

So much for predicting responsiveness to treatment where change is evaluated from different perspectives. For those who are interested in the prediction of a particular criterion variable for some special purpose, either clinical or theoretical, or simply because one may have greater confidence in a particular criterion measure, multiple correlations were computed employing each of the criterion variables as the dependent variable. These multiple correlations were computed by utilizing the stepwise multiple correlational procedure and stopping at the step which yielded the largest, statistically significant value. The multiple correlations are summarized in Table 7; this table also lists Pearson's rs where a significant relationship was found between individual predictors and the criterion (dependent) variable under consideration. Several of the correlations listed in Table 7 have moderate predictive power.

Comments

Table 7

Stacistically Significant Stepwise Multiple Correlations and Pearson's Correlations Between Predictor Variables and Each Criterion Variable, N=41 Ss Who Conditioned and Completed Treatment

Criterion Variable	Predictor Variable(s)	Correlation
8. Nurse's Rating: Amount of Improvement	E Scale	$r = -.411^{**}$
	Extinction, E Scale, N Scale, and IQ	$R = .507^{*}$
9. More Uncomfortable-More Comfortable	%CR	$r = .278^{*}$
	No combination of predictors yielded a significant R	
10. More Soc. Disruptive-More Soc. Conforming	Age	$r = -.341^{*}$
	%CR, Extinction, E Scale, N Scale, Age and IQ	$R = .565^{*}$
11. Less "Healthy"-More "Healthy"	Age	$r = -.296^{*}$
	No combination of predictors yielded a significant R	
12. Σd^2	IQ	$r = -.443^{**}$
	Acquisition, Extinction, E Scale, N Scale, Age, and IQ	$R = .559^{*}$
13. Factor Score W	Age	$r = -.331^{*}$
	%CR and Age	$R = .398^{*}$
14. Factor Score X 15. Factor Score Y 16. Factor Score Z	No predictor variables, either singly or in combination, were significantly related to these criterion variables.	

Note: r = Pearson's correlation; R = multiple correlation
* $p < .05$
** $p < .01$

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SOCIAL FACTORS AS PREDICTORS OF OUTCOME

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The Veterans Administration Hospital in Topeka, Kansas has had an alcoholism treatment program, in one form or other, for the last twenty-four years. The treatment modality offered has varied considerably during this time and has included individual psychotherapy, ataractic drugs, group psychotherapy, didactic lectures, antabuse, hypnotherapy, aversive conditioning, milieu therapy, LSD, human relations training, and, most recently, sensitivity training.

Although the treatment modality has changed frequently, certain commonalities in administrative procedures have emerged which remain constant from modality to modality. Individual treatment was dropped in favor of group treatment, and for the last twenty years patients in the alcoholism programs have been placed on wards separate from other psychiatric patients. Admissions to the program from within the hospital are discouraged, and most patients are admitted from a waiting list. Each patient must complete an application for treatment, which was initially regarded as an indication that the treatment was voluntary and implied some degree of motivation from the applicant.

Programs have been time-limited, and have been discrete rather than continuous. Since the programs are also of a fixed length, it is possible to make schedules months in advance. Although this has the advantage of facilitating guest speakers, staff vacations, family workshops, etc., it has had some unanticipated consequences, in that some patients feel they cannot defer treatment and seek treatment elsewhere.

Presently, the hospital offers three alcoholism treatment programs, two of which meet the criteria listed above. These are the human relations training program, and a small group program based on a small and large dosage of LSD. The third program, a detoxification unit, has recently been opened, and admits only patients in an inebriated or withdrawal state.

It seems axiomatic that the longer the program, the greater number of patients who will be unable to stay through completion.(1,2) Might this also not mean that the longer the program, the greater the number of patients who will not consider applying. Thus, the 90 or 120 day program is not likely to attract the business executive or professional, but a 10 day program starting on one weekend and ending on another may prove highly attractive. How many of us could make arrangements to leave our jobs for 4, 3 or even 2 months at a time? Thus, program length in and of itself tends to impose some limitations on the kinds of applicants the institution will receive.

Let us look at the characteristics of our population presented in Table 1. Patients tend to be in the middle forties, unmarried or not living with wife, are unemployed, and have a long history of heavy drinking. Recently, problems associated with drinking have intensified, and patients have begun to identify themselves as alcoholics, are encountering frequent trouble with the police (almost invariably for such offenses as public drunk, drunk and disorderly, open bottle, or driving while intoxicated), and have been unable to maintain sobriety for more than a 90 day period.

In other projects we have compared the effectiveness of various treatment modalities, and have concluded that very little difference exists between

treatments in terms of predicting outcome as measured by social functioning one year later. The treatments evaluated included (1) group therapy and LSD, (2) human relations and LSD (including use of placebo doses of LSD and variation of times of dosage), and (3) human relations alone.

Using criteria of abstinence, work history, subsequent hospitalizations and police arrests, we were unable to demonstrate significant differences at follow-up between treatment modalities which featured group psychotherapy and an LSD experience versus human relations training and an LSD experience.[3,4] The results are listed in Table 2. A comparison of these two groups revealed that they were similar in terms of age, education, length of drinking problem, and the other variables listed in Table 1.

In a later study, using a scale which included essentially the same criteria listed above, we again found no significant difference in the social functioning at follow-up between patients treated with human relations training and an LSD experience and patients treated by human relations training alone.[5] These findings are presented in Table 3. Again, the groups were well matched in terms of age, education, etc.

This morning I would like to present some data based on 109 consecutive admissions to the Alcoholism Treatment Program. Data was collected through, first, an admission social history interview, and, a personal interview one year following treatment. All variables were dichotomized and analyzed by Chi-square, and are presented in Table 4.

The predictor variables analyzed can be roughly grouped into those of a long-standing nature, and those which describe more recent social functioning. The former group includes birth order, family size, problems in military service,

and education. The latter variables include police arrests, recent work history, marital status, recent hospitalizations and source of support at admission. The criterion variables used to evaluate social functioning for the year after treatment included police arrests, hospitalizations, source of support, pathological drinking, and work history.

Birth order was apparently unrelated to most other demographic variables at the .05 level of significance. One or both parents of the late born died before the late born was 18, and being late born was associated with police trouble after treatment. Size of family was unrelated to any of the post-treatment variables.

Trouble in service was more closely associated with pre-treatment difficulties and in itself was not a good predictor of post-treatment functioning. Trouble in service was related to police trouble, marital problems, and financial dependence before treatment.

Education is associated with divorces, work history, school social life, and family size but not related to post treatment variables. Failing a grade is also unrelated to post-treatment variables.

The best predictors of future functioning appeared to be those variables which measured social functioning just prior to treatment. Thus whether or not a man worked regularly prior to admission is closely associated with the avoidance or recurrence of pathological drinking, work history after treatment (both in length of employment and no job loss). Those with better work histories tended to complete the treatment program.

The man not self-supporting before treatment is unlikely to be self-supporting after treatment. He will have had police trouble, will not be working at follow-up, will have worked less and will be dependent on others. In addition, he is much more likely to have experienced a recurrence of pathological drinking (i.e., shakes, delirium tremens or fits).

Those patients who at admission, are divorced or permanently separated from their wives are more likely to have been hospitalized in the year after treatment, are more likely to have engaged in pathological drinking, and have not worked as many months as those patients who were married at time of admission. Marriage may be an indice of stability which has considerable carryover into other levels of functioning.

Police trouble prior to admission was associated with hospitalization (psychiatric) after, police trouble after, drinking problems after, and poor work history after.

The man who left early had the poorest pre-admission work history, least period of sobriety, was hospitalized more after (medical and psychiatric), had least sobriety after, had lost a job and was not self-supporting,

Another related finding is the living arrangement the patient makes when he leaves the hospital. No matter how well he responded to treatment, the patient who returns to an isolated hotel room or lives alone in an apartment seems predestined to fail.

With these factors in mind, if one were interested in compiling a healthy batting average in terms of the number of successes vs. cases

treated, then the process of selection should be narrowed to admit those who were self-supporting, working prior to admission, had no trouble with the police, and had not had prior hospitalizations.

However, the various sanctions under which an institution operates frequently does not allow such manipulation so that we find ourselves back to the realization that certain kinds of institutions attract certain kinds of patients with certain kinds of attributes. Further we find that most often what eventuates after treatment is more a product of the attributes a patient brings to treatment than in the treatment itself.

We find that most of our patients can be classified very roughly into one of two types. The first type is characterized by a desire for relief or assuagement, not necessarily change. He has had a drinking problem for over ten years, has been hospitalized in several VA or state hospitals and a year later will regard the highlights of the treatment program as good food, plenty of rest, and physical reconstitution. This patient typically was unemployed at both interviews, and was supported by compensation, family, or public welfare.

The second type, and it is from this group that we perceive the greatest change, is characterized by the recency of pathological drinking, the relatively high level of social functioning prior to treatment, few if any hospitalizations, and a desire for change rather than relief. These patients describe the highlights of the program as either insights gained through small group discussions or training sessions or techniques they can bring back to the community (i.e.,"don't let little problems develop into big problems," "leveling," etc.). Basically, then these

patients come to treatment for different purposes. The nature of the institution, its historical background (e.g., city hospital, treatment of veterans, treatment of Indians, etc.) and criteria for admission preclude any drastic changes in the population served. Thus, the institution is forced to make do with what is at hand.

In conclusion, the results of hospital treatment for alcoholism are greatly influenced first by the limitations the hospital imposes as to who is eligible to receive treatment, and, second, by the kinds of patients the program attracts. One of the problems of a talk-oriented program is that large numbers of potential patients have great difficulty deriving maximum benefits from such program. A dilemma facing staff is to limit admissions to those who will benefit most, or develop an alternate program more suitable to the inarticulate. At the very least, we should consider giving each patient full information about treatment programs available, and let him make his own treatment selection. This is what is occurring presently; the only change is that selection can then be made on the basis of the best information available rather than the grapevine. In our case, we should then expect many patients to select detoxification rather than human relations as the treatment of choice.

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Table 1

Description of Population

Variable	Average
Age	44
Education	11.6 years
IQ	102 (Revised Alpha Examination)
Marital Status	46% married and living with wife
Employment Status	60% unemployed
Drinking Status	13 years heavy drinker 8 years problem drinker 5 years alcoholic longest sobriety 90 days in last 10 years
Previous Hospitalization	3 in 4 for medical treatment 1 in 4 for psychiatric treatment 2 in 4 for alcoholic treatment
Police Trouble	arrested in last year - 60%

Table 2

Criterion Variables for One Year Personal Follow-Up of Patients Completing the Program

Variable	Group Therapy and LSD	Human Relations and LSD	Combined
Abstinent the Whole Year	25%	19%	22%
Abstinent Four or More Months	61%	50%	56%
Employed Six or More Months	61%	49%	55%
Additional Hospitalizations for Any Reason	34%	49%	42%
Arrests	34%	39%	37%

Note.--This data is based on 59 group psychotherapy patients and 70 human relations patients. These are the patients who both completed the program and could be located for follow-up interviews.

None of the differences between group therapy and human relations are statistically significant.

Table 3

Treatment Modality and Post-Treatment Outcome

Treatment Modality	Level of Functioning at Outcome		
	Poor	Fair	Good
HRTL and LSD	31%	53%	16%
HRTL only (no LSD)	38%	44%	18%

Note: This data is based on 49 patients who received LSD and 50 patients who did not. These are the patients who both completed the program and could be located for follow-up interview. The difference in functioning between the two groups is not statistically significant.

Table 4

A Comparison of Admission and Outcome Variables

Criterion Variables	Predictor Variables								
	Birth Order	Family Size	Problems in Military	Education	Marital Status	Police Arrests	Work History	Hospital-ization	Source of Support
Police Arrests	.05	n.s.	n.s.	n.s.	n.s.	.05	n.s.	n.s.	.05
Hospitalizations	n.s.	n.s.	.05	n.s.	.05	.05	.01	.05	n.s.
Source of Support	n.s.	n.s.	n.s.	n.s.	n.s.	.01	n.s.	.05	.05
Pathological Drinking	n.s.	n.s.	n.s.	n.s.	.001	.01	.01	.05	.05
Work History	n.s.	n.s.	n.s.	n.s.	.05	.05	.001	.05	.01

BRAIN DAMAGE AS A FACTOR IN TREATMENT OUTCOME OF CHRONIC ALCOHOLIC PATIENTS

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Paper presented at the Annual Meeting of the
American Psychological Association
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The research literature is by this time making a good case for the presence of substantial brain dysfunction in individuals with long term chronic alcoholism. It is not the purpose of this paper to support or refute this view, but rather to evaluate the functional consequences of the brain damage if it indeed exists. That is, if an alcoholic patient shows or does not show psychological test evidence for the presence of organicity, does this have any substantial bearing on how he progresses following treatment? Thus we are asking a practical rather than a theoretical question.

For several years now we have been using the Reitan modification of the Halstead Neuropsychological Battery, a series of tests of cognitive, perceptual and motor skills shown to be sensitive to brain dysfunction. We administered these tests to a group of 53 sober but chronic alcoholic patients shortly after admission to the treatment program at the Topeka VA Hospital. Their mean age was 45 years, with an average of 12 years of education. On the average, they had drinking histories that extended 20 years or more, and a high proportion of them were divorced and unemployed. None of the patients used in the study had the diagnosis of chronic brain syndrome listed in their medical records.

For purposes of the present study, subjects were divided into three groups on the basis of a global index score derived from the Halstead Tests. This score is called the Average Impairment Rating; it is obtained by converting raw test scores from 12 measures to ratings reflecting degree of impairment, and taking the average of these ratings.

The higher the rating, the more severe the impairment. A five point scale is used, and in our general population a rating of 1.35 or higher is considered to be in the "brain damaged" range. Alcoholic subjects with Average Impairment Ratings of 1.35 or less were placed in the normal range; a score between 1.36 and 2.00 placed the subject in the intermediate range, while a score of 2.01 or higher placed the subject into the severely impaired range. An analysis of variance performed to show that the three groups were indeed different from each other yielded an F of 144.24, a result that is significant well beyond the .001 level.

The aim of the study was that of determining whether treatment outcome was related to range of functioning level on the neuropsychological tests. It would naturally be expected that the normal range patients might be able to use their relatively intact adaptive abilities in attempts to improve their lot, while the severely impaired patients would be less able to do so. Improvement was evaluated by a global index, one devised by Mr. Bowen, our research social worker. The index score used includes ratings on the following indices of improvement: degree of abstinence, length of employment, membership in social organizations, alcohol related law violations, presence of DTs or convulsions and hospitalizations for alcoholism or related illnesses. The obtained ratings may range from 0 to 8, with higher scores reflecting greater improvement.

Of the 53 patients originally tested, 40 were located for follow-up one year following discharge from the treatment program. Of these 40, 10 had neuropsychological test scores that placed them in the normal range; 20 were in the intermediate range, and 10 in the severely

impaired range. The global outcome score was obtained for each subject, and the mean for each impairment range was computed. The mean for the normal range subjects was 3.30, (SD = 2.33) for the intermediate range subjects it was 3.65, (SD = 2.73) and for the severely impaired subjects, it was 3.50, (SD = 2.16). A simple analysis of variance was performed and yielded an F ratio of .06, a clearly non-significant value. Thus, no relationship was found between degree of impairment and treatment outcome.

The results of this study indicate that while many alcoholics show the kinds of cognitive, perceptual and motor deficits often associated with the presence of brain lesions (73% in this study) the relevancy of this consideration to treatment outcome is questionable. Perhaps more refined analysis of our data going beyond utilization of global measures only would change the picture somewhat, but the absence of even a trend in the data presented makes this possibility unlikely. It is probably safest to say that if one is seeking predictors of treatment outcome in alcoholics, he would probably do better by looking into areas other than neuropsychology. Apparently there are prepotent factors in the person or in the environment.

While the results of the study are statistically non-significant, they raise some rather important questions. First, what and how well do we predict with our psychological tests? Here we had an opportunity to obtain a number of measures on the basis of which it was possible to make predictions to an independently established, reasonably objective criterion variable. We also had what sounded like a tenable hypothesis;

that more impaired people would fare worse than less impaired people. In measuring degree of impairment we used a much investigated series of tests whose validity and reliability had been well established. What more can one ask for in doing a predictive study? It appears that it is necessary to take a more sophisticated approach to prediction in which a number of variables must be considered, both personal and environmental in nature.

Questions may also be raised regarding the nature of the treatment. All of the patients in our sample received either LSD or group-oriented psychiatric treatment. It is possible that treatment suited to the level of impairment of the patient may have contributed to the creation of differences among the groups. However, the fact that the severely impaired patients did no worse than the others with the rather high level verbally oriented treatments we have been using, makes this possibility somewhat doubtful. It is possible that the level of improvement in all groups may be raised if treatments were designed to be appropriate for the level of functioning of the patient.

What the study actually seems to show is that individuals with rather severe impairment can do exceptionally well or poorly following treatment as can alcoholics with no significant impairment. As psychologists we may be disappointed to learn that in some instances our tests seem to have little to do with what happens in the real world, but it is somewhat encouraging to learn that individuals with severe impairment can do well despite this, apparently because of motivational factors and supporting influences in the environment.