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Admission Characteristics as Predictors of Alcohol Outpatient Treatment Contacts

William Charles Marshall
Western Michigan University

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ADMISSION CHARACTERISTICS AS PREDICTORS OF ALCOHOL OUTPATIENT TREATMENT CONTACTS

by

William Charles Marshall

A Thesis
Submitted to the
Faculty of the Graduate College
in partial fulfillment of the
requirement for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
August 1980

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William Charles Marshall
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MARSHALL, WILLIAM CHARLES
ADMISSION CHARACTERISTICS AS PREDICTORS OF
ALCOHOL OUTPATIENT TREATMENT CONTACTS.
WESTERN MICHIGAN UNIVERSITY, M.A., 1980
INTRODUCTION

Alcohol abusers and alcoholics are generally considered difficult to retain in treatment, especially as outpatients. Dropout rates for these patients are very high, ranging from 28 to 80% for the first month of treatment (Baekeland, 1973). The results of one study showed only,

"15.2% of the patients make 'high' use of outpatient services (more than three appointments kept). In one case, 50% of the patients who came to a psychiatric clinic dropped out after one visit, and, in another case, over half of a group of low socio-economic level outpatients...dropped out within four sessions. This phenomenon is so general that one writer was led to state that 'there is increasing recognition that many, if not most, patients coming to clinics need or will use only a few visits' (Brandsma, 1977, p. 23)."

The cost of these premature terminations to both clinics and patients is also very high. Much evidence suggests that alcohol abusers and alcoholics who stay in treatment for long periods have higher abstinence rates (Baekeland, 1973; Smart, 1978). Many do not stay in treatment long enough to adequately decide on its value to them. Others, who seek treatment initially when suffering from the effects of a protracted drinking spree, then dropout as they begin to feel better physically. Clinics and their staff spend a high proportion of their time and energy in initial interviews. Consequently, waste results when the expenditures incurred in gathering and processing admission information as well as the counselors' efforts to build a trusting relationship are abruptly halted by the patient's unadvised withdrawal. The remaining benefit of the clinic's intervention lies in the hope that at a

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later date the patient will return to, and persevere in, treatment. However, each additional admission adds costs not incurred in an uninterrupted treatment schedule.

Ideally, prediction of dropouts at admission would alert clinics to withhold expensive interventions, such as psychological testing and medical examinations, unless the patient subsequently persisted beyond the third or fourth treatment contact. This prediction would also alert clinic staff to employ special attention to maintaining this group of patients in treatment. The goal of every competent alcohol counselor is the rehabilitation of the patient. A greater percentage of patients presenting themselves for treatment are likely to be rehabilitated when treatment dropout rate is reduced by the program's ability to distinguish between dropouts and continuing patients.

Research in the area of alcohol treatment completion is occurring at an increasing rate. The author found 47 studies listed in Psychological Abstracts since 1970, about 75% of which have been published since 1975. Variables ranging from personality factors, such as hostility and the need for social approval, to the patient's physical health have been tested with varying success. Based on the research conducted thus far, the best indicators of treatment completion are a combined index of treatment variables (e.g., staff absence, use of Antabuse) and the demographics of the patient (e.g., age, social class, source of referral). Objective personality inventories, such as the MMPI and Rotter's Locus of Internal-External Control are weak predictors.
By and large, previous research is not purely experimental in
design. Most noticeably absent are control groups and manipulation
of an independent variable. Typically, a study will test the degree
of correlation between characteristics of patients in a sample and a
dichotomous dependent variable, e.g., completion/withdrawal. That
is, at admission or shortly after, data are gathered on the factor
or factors that the researchers have hypothesized might have some
relation to treatment completion or dropout. Then, after the program
has run its course, characteristics of patients who completed treat-
ment are statistically compared to those who terminated early.
Significance of a given factor can then be interpreted as either
related or unrelated to completion of that program. Without addi-
tional information and testing, there is no basis to conclude that
factors found to be significant in this manner cause treatment
completion or withdrawal (i.e., variables which are correlated are
not necessarily causally related).

A major weakness of previous research has been an overreliance
on the t-test and analysis of variance for statistical analysis.
Nominal variables such as sex and employment status violate the
interval scale and normal distribution requirements of these statistics.
This overuse appears to be a function of researcher's familiarity
with these two statistics. The use of completion/withdrawal as the
dependent variable in many studies poses another design problem.
Since programs vary in length and modality, a factor demonstrated to
be significant of completion at one facility cannot be reliably
generalized to other clinics.
One study which departed from the use of completion/withdrawal as the dependent variable was conducted at the State University of New York, Downstate Medical Center, New York City (Baekeland, 1975). Baekeland and his associates divided subjects into four categories based on the number of treatment contacts they had had with this outpatient facility prior to discharge. The first group, "Immediate dropouts" (those who failed to return after their first visit), were most likely to live alone and had suffered the least impairment of their capacity. They were also characterized by ambivalence, anxiety, depression, and were not abstinent upon admission. The second group, "Rapid dropouts" (those who dropped out after one to four weeks of treatment), were marked by high levels of anxiety, depression, and somatic and psychosomatic symptoms. The third group, "Slow dropouts" (those who dropped out during the second to fifth month of treatment), were highly motivated for treatment, mildly symptomatic, and socially intact individuals without a family history of alcoholism. This study of the admission characteristics of 143 patients demonstrates the increased information made available through the expansion of the dependent variable beyond a dichotomy.

Two studies took the final step of elevating the dependent variable from simple nominal categories to interval scales. In an effort to measure length of stay (as measured in weeks), Altman, Evenson, and Dong (1978) gathered data from the admission records of 1233 patients discharged from treatment programs at four Missouri state hospitals and two metropolitan centers during 1966 through 1971. Diffendale (1975) measured continuation on the basis of the number of outpatient contacts. The results of each study are summarized in the following.
The variable pool for the Altman, et al. study consisted of 111 items from the Missouri Automated Mental Status Examination, 73 demographic items from the patient's face sheets, and 12 major diagnostic categories. An additional 132 items were added to the variable pool by use of the Emergency Room Checklist, which concerns the patient's status or behavior during the four weeks prior to admission. A stepwise multiple regression analysis found 20 of these variables to be significant, yielding a multiple correlation of .38. This may be compared with a multiple correlation of .45 for general psychiatric patients in the same facilities (Altman, et al., 1978). Patients found likely to remain in the programs fall into two categories: (1) patients with antisocial tendencies, such as those who have deserted a family, used amphetamines, used an assumed name, or have been characterized by "excessive fighting"; and (2) patients with mixed diagnoses, such as simple schizophrenics who misuse alcohol.

Diffendale (1975) administered a psychometric battery consisting of the Group Personality Projective Technique, which measures the need for affiliation, withdrawal, succorance, and the degree of neuroticism; the IPAT 8-Parallel-Form Anxiety Battery; Depression Adjective Checklist; and the Famous Sayings Test. He also gathered data on marital status, age, with whom the patient resided, and employment stability. Older patients who were employed, and whose families participated in treatment were more likely to continue. Of all the measurements of interpersonal variables, only the change score for succorance was related to continuation. Those who became more independent and distrustful psychometrically were more likely
to continue treatment. This finding fits with the context of the treatment program which encouraged distrust of drinking friends.

What is needed is a prediction equation which can accurately estimate the number of treatment contacts an individual will have as an outpatient, or in the case of inpatient facilities, his or her length of stay. Ideally, data used to generate this equation should be gathered during the admission interview so that treatment planning can proceed immediately with knowledge of the likelihood and length of the individual patient's retention in the program. Otherwise, the patient may drop out before the program has acquired the data with which to predict that outcome. The present study is one attempt to use admission characteristics at an outpatient alcohol clinic to predict number of treatment contacts. Both multiple regression and discriminant function analyses were employed, in part, because of their ability to routinely generate prediction equations. A modified form of Baekeland's dropout categories appear in the discriminant analysis.
METHOD

Subjects

Subjects in this study were selected from closed cases of New Directions Alcohol Treatment Center, Kalamazoo, Michigan. All were outpatients admitted for treatment of alcohol related problems during the calendar year 1979 through March of 1980. A total of 308 cases were available; however, for many case files, data on one or more of the independent or dependent variables were missing. Casewise deletion was applied to these case files with reduction of the sample size to 171.

Of the 171 subjects selected, 120 (70.2%) were male and 51 (29.8%) were female; 146 (85.4%) were White, 17 (9.9%) were Black, 6 (3.5%) were Hispanic, and the remaining 2 (1.2%) were American Indian. Subjects represented a wide diversity in age. At the time of admission, the youngest was 13 and the oldest was 77, with a mean age of 31.2 years. None were aware of his or her selection for the study, since all had terminated treatment before the data were gathered. To meet the requirements for research on human subjects, the author submitted a request for approval to Western Michigan University's Human Subject Review Committee. Approval was granted by this committee on March 25, 1980. Data used in the study excluded identifying information for any individual client.

Of the 171 subjects, 48 (28.1%) were married, 79 (46.2%) were single, and 44 (25.7%) were either separated, widowed, or divorced.
Almost half (47.7%) were unemployed, with the mean length of employment being 28.4 months.

**Procedure**

While the author was an intern at New Directions Alcohol Treatment Center (NDATC), the project director expressed a concern over the number of early terminators which NDATC had had since its opening approximately 2 years earlier. One prior survey had been conducted, but never completed. Further efforts into the investigation of the factors underlying early termination were being hampered by a lack of available staff time to gather and analyze data. It was decided by the project director and the author to use the previously gathered admission data as an economical means of predicting early terminators.

NDATC uses the Areawide Data Evaluation System (ADES), developed by its regional coordinating agency, the Kalamazoo County Department of Substance Abuse Services. Admission, discharge, and staff activity logue information is routinely gathered for each client which NDATC records on pre-printed forms developed by the coordinating agency (see Appendix 1). These forms are then forwarded to that agency for computerized coding and storage. These data are available to the State of Michigan's Office of Substance Abuse Services and to the project's director. The ADES forms are designed in such a way that names and other identifying information remain in the NDATC case files. Only the lower portion of the form is sent to the coordinating agency (see Appendix 1). Clients are known to the computer by their case numbers which are key punched into the terminal along with the
rest of the data. This system insures that neither the state nor the coordinating agency can breach the confidentiality of NDATC clients.

To initiate the study, the project director made a request for the data retrieval from the ADES system to the coordinating agency. This request was approved and the data were transferred electronically to a protected file in Western Michigan University's PDP-10 computer. As further precaution to protect the subjects' anonymity, case numbers were expunged from the data before transfer.

The independent variables selected as predictors of the number of treatment contacts, were the client's sex, race, marital status, number of months on present job, age at admission, voluntary versus involuntary referral, and whether there were other substance users in the household. Marital status (Altman, Evenson, & Dong, 1978; Cummings, 1975), unemployment (Altman, et. al., 1978), age (Cummings, 1975), and voluntary versus involuntary referral (Cummings, 1975) have been shown to be related to alcohol treatment completion or withdrawal in previous research. Sex, race, and the presence of other household substance users were added to test hypotheses that these factors might also be related to alcohol treatment completion or withdrawal.

Included with each subject's data set was the number of treatment contacts he or she had had in group and/or individual therapy before discharge. The prediction of the number of treatment contacts was the goal of this study and, therefore, treatment contacts were used as the dependent variable. For further rationale supporting the choice of this variable as the dependent variable, the reader is referred to the Introduction section of the paper.
The raw data were then recoded in preparation for multiple regression and discriminant function analyses. A consultant from the university computing center, using subprograms of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrener, & Bent, 1975), developed a control program to perform this task. Recoding was necessary due to the alphabetical recorded form of most of the independent variables and the difficulty of interpreting a regression analysis of a nominal variable with more than two categories. For example, without recoding, a female, divorced subject appears as A (Female), C (Divorced). After recoding to form variables which are both dichotomous and numerical in form, the computer program is able to analyze her as 1 (Female), 1 (Unmarried). This example illustrates the variable relabeling which occurs in creating a dichotomy. For Marital Status, variable labels married, widowed, divorced, separated, and single were collapsed into two categories: married and unmarried. No distinction was made between married and separated subjects, or single, divorced, and widowed subjects. The former are married, legally, and the latter are not. Legal status was also employed in establishing the variable "voluntary versus involuntary" referral. Twenty-two sources of referral were recoded into the categories of either voluntary or involuntary referral, depending on whether or not the referral source was one of the four with the force of the law behind it. For a complete description of the recoding process, see Table 1.
TABLE 1

Comparison of Raw to Recoded Data

<p>| Variable                  | Raw Data Form | Recoded As | |
|---------------------------|---------------|------------|
|                           | Label Code    | Label Code |
| Sex                       | Female        | Female     | 1 |
|                           | Male          | Male       | 0 |
| Race                      | Black         | Non-White  | 1 |
|                           | White         | White      | 0 |
|                           | Hispanic      | Non-White  | 1 |
|                           | American Indian| Non-White | 1 |
| Marital Status            | Married       | Married    | 0 |
|                           | Widowed       | Unmarried  | 1 |
|                           | Divorced      | Unmarried  | 1 |
|                           | Separated     | Married    | 0 |
|                           | Single        | Unmarried  | 1 |
| Months on Present Job     | Months (#)   | Months     | #1 |
|                           | Unemployed    | Months     | 0 |
| Voluntary vs. Involuntary | EMS           | Voluntary  | 0 |
| Referral                  | Approved Service Program | Voluntary | 0 |
|                           | Alcoholics Anonymous | Voluntary | 0 |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Raw Data Form</th>
<th>Recoded As</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Label</td>
<td>Code</td>
</tr>
<tr>
<td>Voluntary vs. Involuntary Referral</td>
<td>Other Treatment Program</td>
<td>d</td>
</tr>
<tr>
<td></td>
<td>Employee Assistance</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>Highway Safety</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>Prevention Program</td>
<td>g</td>
</tr>
<tr>
<td></td>
<td>Self</td>
<td>h</td>
</tr>
<tr>
<td></td>
<td>Court Referral (Driving)</td>
<td>i</td>
</tr>
<tr>
<td></td>
<td>Court Referral (Other)</td>
<td>j</td>
</tr>
<tr>
<td></td>
<td>Police</td>
<td>k</td>
</tr>
<tr>
<td></td>
<td>Secretary of State's Office</td>
<td>l</td>
</tr>
<tr>
<td></td>
<td>Mental Health</td>
<td>m</td>
</tr>
<tr>
<td></td>
<td>Social Services</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>Other Human Service Program</td>
<td>o</td>
</tr>
<tr>
<td></td>
<td>Family/relative</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Employer</td>
<td>q</td>
</tr>
<tr>
<td></td>
<td>School</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>Physician</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>Hospital</td>
<td>t</td>
</tr>
<tr>
<td>Other Household Substance Users?</td>
<td>Yes</td>
<td>a</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>b</td>
</tr>
</tbody>
</table>

1 Actual number of months recorded
RESULTS

The correlations of the 7 predictor variables with each other and the criterion are shown in Table 2. Six significant correlations were found between predictor variables; however, only Months on Present Job and Voluntary versus Involuntary Referral were significantly related to Number of Treatment Contacts. Older clients were more likely to be married and have greater job stability than their younger counterparts, $r(175) = -0.392$ and $+0.486$, respectively, $p < .01$. Females tended to be court referred, $r(175) = -0.251$, $p < .01$, and to have other substance users in the home, $r(175) = -0.267$, $p < .01$; while males tended to come to treatment voluntarily and report themselves as the only household user. Involuntary referrals were more likely to be unmarried, $r(175) = +0.182$, $p < .05$. Finally, married clients as a whole had greater job stability, $r(175) = -0.277$, $p < .01$.

To develop an index of client admission characteristics to predict the number of treatment contacts, a stepwise multiple regression analysis was computed. Each of the 7 predictor variables was entered into the computer; however, only Voluntary versus Involuntary Referral and Months on Present Job were significantly related to the criterion (see Table 3).

From these findings, the resulting prediction equation is:

$$y = 0.0086x_1 + 1.000x_2 + 2.6,$$

where $y =$ Number of Treatment Contacts, $x_1 =$ the Number of Months on Present Job, and $x_2 =$ the coded Voluntary versus Involuntary Referral.
TABLE 2

Correlations of Predictor and Criterion Variables (N=171)

<table>
<thead>
<tr>
<th></th>
<th>#TC</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Ref</th>
<th>Marital</th>
<th>Months</th>
<th>Husers</th>
</tr>
</thead>
<tbody>
<tr>
<td>#TC</td>
<td>1.00</td>
<td>.122</td>
<td>.006</td>
<td>.033</td>
<td>.160*</td>
<td>.048</td>
<td>.171*</td>
<td>-.068</td>
</tr>
<tr>
<td>Age</td>
<td>1.000</td>
<td>-.072</td>
<td>-.024</td>
<td>-.129</td>
<td>-.392**</td>
<td>.486**</td>
<td>.141</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>1.000</td>
<td>-.125</td>
<td>-.251**</td>
<td>-.010</td>
<td>-.113</td>
<td>-.267**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>1.000</td>
<td>.018</td>
<td>-.082</td>
<td>-.054</td>
<td>.034</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ref</td>
<td>1.000</td>
<td>.182*</td>
<td>-.055</td>
<td>.013</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital</td>
<td>1.000</td>
<td>-.277**</td>
<td>.046</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Months</td>
<td>1.000</td>
<td>.087</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husers</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .05 \)
** \( p < .01 \)

Note: #TC = Number of Treatment Contacts
Ref = Voluntary Vs. Involuntary Referral
Months = Months on Present Job
Husers = Other Household Substance Abusers
**TABLE 3**

Summary of Stepwise Multiple Regression Analysis (N=171)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months</td>
<td>.86D-02</td>
<td>1,174</td>
<td>5.84*</td>
</tr>
<tr>
<td>Ref</td>
<td>.10D+01</td>
<td>1,174</td>
<td>5.20*</td>
</tr>
<tr>
<td>Constant</td>
<td>.26D+01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiple R</th>
<th>$R^2$</th>
<th>Standard Error</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>.242</td>
<td>.059</td>
<td>2.718</td>
<td>2,168</td>
<td>5.23**</td>
</tr>
</tbody>
</table>

* $P < .05$  
** $P < .01$
score. From Table 3, the standard error of the multiple regression coefficient can be used to develop a 68% confidence interval from which the number of treatment contacts predicted by the equation may vary. Thus, \( Y = y + 2.718 \), where \( Y \) is the actual number of treatment contacts, and \( y \) is the number of treatment contacts predicted by the regression equation. This wide band of error is due to the fact that the two predictor variables account for only 5.9\% (\( R^2 \)) of the variance of Number of Treatment Contacts.

To test the hypothesis that individuals in three different treatment contact ranges could be correctly classified as either Immediate dropouts, Rapid dropouts, or Continuers, a stepwise discriminant analysis was performed using all seven of the original predictor variables. Immediate dropouts were defined as those clients who came for the initial intake session, but did not return for further treatment (\#TC=1). Rapid Dropouts were those clients who terminated after either the second or third visit (\#TC=2 or 3). Clients who had 4 or more treatment contact were designated Continuers. (Note: Maximum \#TC possible in this sample was 12.)

All of the predictor variables, except for Race, contributed to the ability of the discriminant functions to classify cases in the sample as either Immediate dropouts or continuers. At Step Number 6, a Wilks' Lambda of 1871, \( p=.03 \), was obtained after the final variable, Sex, was entered.

Just as multiple regression coefficients can be used to predict \#TC, classification coefficients derived from a discriminant analysis can be used to predict immediate dropout, rapid dropout, or continuer group membership for an individual case. These classification
coefficients are to be multiplied by the raw variable values, summed together, and added on to a constant. Since immediate dropouts, rapid dropouts, and continuers form three separate groups, three separate classification equations were developed as follows,

Group 1  \( C_{im} = (2.10105)(\text{Ref}) + (-.01302)(\text{Months}) + (1.17795)(\text{Husers}) + (5.42357)(\text{Marital}) + (.36528)(\text{Age}) + (2.76454)(\text{Sex}) \)

Group 2  \( C_{rd} = (1.48424)(\text{Ref}) + (-.01291)(\text{Months}) + (1.29342)(\text{Husers}) + (6.14870)(\text{Marital}) + (.40121)(\text{Age}) + (3.14990)(\text{Sex}) \)

Group 3  \( C_{cs} = (2.95434)(\text{Ref}) + (-.00764)(\text{Months}) + (.75050)(\text{Husers}) + (5.45391)(\text{Marital}) + (.38696)(\text{Age}) + (3.29316)(\text{Sex}) \)

where \( C_{im} \), \( C_{rd} \), and \( C_{cs} \) are the classification scores for the immediate dropout, rapid dropout, and continuers groups, respectively. The case would be classified into the group with the highest score. These equations correctly classified 47.95% of the cases in the study. This represents almost a 15% improvement over chance (33%).

The equations were best at classifying continuers, 56.6% (n=30), and were least accurate in classifying immediate dropouts, 39.7% (n=25) (see Table 4).
# TABLE 4

Prediction Results of Discriminant Analysis (N=171)

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>Number of Cases</th>
<th>Predicted Group Membership</th>
<th>Immediate Dropout</th>
<th>Rapid Dropout</th>
<th>Continuers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Dropout</td>
<td>63</td>
<td></td>
<td>25</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>39.7%</td>
<td>30.2%</td>
<td>30.2%</td>
</tr>
<tr>
<td>Rapid Dropout</td>
<td>55</td>
<td></td>
<td>15</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27.3%</td>
<td>49.1%</td>
<td>23.6%</td>
</tr>
<tr>
<td>Continuers</td>
<td>53</td>
<td></td>
<td>9</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17.0%</td>
<td>26.4%</td>
<td>56.6%</td>
</tr>
</tbody>
</table>
DISCUSSION

The results of the present study indicate that certain admission variables from the Areawide Data Evaluation Service (ADES) are predictive of the number of outpatient treatment contacts for alcohol clients similar to the New Directions Alcohol Treatment Center group. Involuntarily referred clients see their counselors more frequently than those who come to treatment without legal coercion, $p < .05$.

Job stability, as measured by a large number of months on the client's present job, also contributes to a more frequent number of treatment contacts, $p < .05$. On the other side of the coin, unemployed clients who come to outpatient clinics voluntarily tend to dropout earlier. When information on both of these variables is available, significance between them and the number of treatment contacts becomes even higher, $p < .01$.

The author interprets the correlation between number of months on present job (Months) and number of treatment contacts as positive transfer of an established routine. Outpatient therapy, like employment, requires an individual to repeatedly commute to a particular place, at a particular time and day. Loss of employment disrupts the routine of keeping a regular schedule, and short-term employment may not have adequately reestablished the routine. Since alcohol counseling is often confrontive in nature, the aversiveness of the pending confrontations with the counselor may be the deciding factor in termination with individuals with little or no consistent time structure.

Involuntary referral effects can be viewed as the preference of treatment at NDATC to incarceration in the county jail. In addition, the treatment program itself leads to a greater number of treatment
contacts. Court-referred clients are most often required by the agency to complete a treatment plan consisting of two individual and four group sessions before completion is reported to their probation officers. Voluntary clients also are channeled through this treatment plan, but do not have the force of legal coercion to maintain them for the entire six sessions.

These findings differ from those of Brandsma et al (1977) who found no differences between the attendance of court-probated and voluntary clients. In addition, almost twice as many patients attended three or more sessions in the present study than in that of Brandsma's (31% versus 17%). Without further analysis, these apparent contradictions can only be accounted for by differences between the subjects and treatment of the two studies. On the positive side, the retention of involuntary clients is supported by Altman, et al. (1978) and Baekeland et al. (1973), and the present study's findings of nonsignificance for the Marital Status variable concurs with Cummings (1975). Due to the vast superiority of the sample size (n=1233 versus 43), Altman et al.'s work is judged by the author to be of greater weight than Brandsma, et al.'s in deciding the significance of involuntary referral in the general alcohol client population. The Altman et al. study is also easier to compare with the present study in that both employ a multiple regression analysis with a similar dependent variable: present study = #TC, Altman et al. study = Length of Stay (LOS). With the additional support by Baekeland et al., involuntary referral as a means of outpatient continuation appears justified.
Despite the high statistical significance of these two variables (Months and Referral), their clinical utility is limited. Because of the low value of $R^2$ (5.9%), there can only be 68% confidence that the actual #TC will be within a range of 6 sessions when Months and Referral are the x variables in the multiple regression equation. More accurate prediction is possible by using the results of the discriminant function analysis. The three equations using six variables allow an almost even chance overall (47.95%) of correctly classifying an individual case as either an Immediate Dropout (1 TC), Rapid Dropout (2 or 3 TC), or a Continuer (4 or more TC). Furthermore, if Rapid Dropouts are combined with Immediate Dropouts, the ability to distinguish them from Continuers increases; thus, boosting the correct classification rate to 72.9%. A 27.1% margin of error is still less than perfect, but is much smaller than the chance error rate of 50% without the equation. In summary then, the discriminant classification equations provided a clinically useful means of differentiating dropouts from continuers for this population of alcoholic clients.

The final roadblock to providing this information routinely to counselors is one of computation. For each group prediction, 21 calculations must be made, which would be a tedious process for busy counselors and/or other staff. The author suggests that the coordinating agency develop the necessary program from the classification equations given in this paper. Data from each of the six items of the ADES Admission form could then be used to generate a classification for each new client and feedback to NDATC in the form of a computer printout on a weekly basis. The project director would then
have the opportunity to discuss this information with counselors, either privately or during staff meetings, along with methods of maintaining the client in therapy.

Further research will be required before the exact number of treatment contacts can be accurately predicted. The months on present job and voluntary versus involuntary referral will make even a greater contribution to the prediction when placed in combination with other variables found to be significant in other studies. Until this equation becomes a reality, admission characteristics, clinical judgement, and other factors will be used to predict the number of alcohol client treatment contacts.

The final question is how to maintain alcohol clients in treatment long enough for their successful rehabilitation once premature dropout appears likely. The therapeutic interventions demonstrated to maintain alcohol clients in treatment are beyond the scope of this paper. However, due to the subsequent relevance of these interventions once the number of treatment contacts is predicted, a brief review of other work in maintenance is included here.

Initial interviews can be crucial to the decision to stay in outpatient therapy. Such was the case in one study which found that few patients terminated when their initial interview was predominately focused on alcohol related problems rather than other personal or interpersonal concerns (Larkin, 1973).

Modeling has been demonstrated to be effective in a population of veterans as a means of motivating alcoholics to request Antabuse and entrance into a 30 day post-detoxification treatment program (Johnson, 1977). Seventy veterans were randomly assigned to either an experimental group (n=35), which viewed videotapes emphasizing
Antabuse and the 30 day treatment as highly successful forms of treatment or an experimental group (n=35) which did not view or discuss the tapes. A greater percentage of the experimental group requested Antabuse (80% vs. 20%), and entrance into the 30 day treatment program (71% vs. 51%).

One other measure which successfully relates the nature of inpatient treatment to subsequent aftercare (outpatient) is the patient's perception of ward autonomy (Pratt, Linn, Carmichael, & Webb, 1977). This finding was delineated from a significant difference between the autonomy factor scores on the Ward Atmosphere Scale of attenders vs. non-attenders. Outpatient clinics which serve as aftercare facilities for detoxification centers may persuade their inpatient centers to encourage patients to be independent and take leadership on the ward as a means of increasing outpatient continuation after detoxification. Both comprehensive and independent outpatient clinics may use this finding by analogy. In individual therapy, autonomy should be expressed by the patient's involvement in the treatment planning and goal selection. In group sessions, actual leadership responsibilities may be delegated by the therapist.

Prediction of the number of treatment contacts and motivating alcohol clients to continue treatment until completion has been discussed. Additional work is needed in both areas and will undoubtedly occur as evidenced by the increasing volume of research in these areas in recent years. Admission characteristics, particularly Voluntary vs. Involuntary referral and Months on Present Job, have been demonstrated in this study to be predictive of Number of Treatment Contacts. Other researchers have found autonomy,
initial interview focus on alcohol, and modeling to be effective as means of outpatient continuation. It is interesting to note that two of these factors, autonomy and modeling, are integral parts of Alcoholics Anonymous, the self-help predecessor to almost all forms of outpatient treatment.
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APPENDIX A

TREATMENT ADMISSIONS FORM

Name: ________________________________
In case of emergency notify: ________________________________
Street: ________________________________
City, State: ________________________________
Phone: ________________________________

Program ID: ________________________________
Staff ID: ________________________________
Client ID: ________________________________

Service Category
a. Approved Service Provider (ASP/1269)
b. Inpatient
c. Residential - Treatment (or only)
d. Outpatient - Methadone maintenance

Admission Date (mo/yr): ________________________________

County/City/Village/Township Code: __________

Admission Type
a. First admission
b. Readmission
c. Number of admissions to a substance abuse program
a. admissions 5
b. unknown

d. Primary reason/problem for this admission
a. alcohol
b. drug use (heroin, marijuana, meth, etc.)
c. other drugs (poly-drug)
d. spouse's problem
a. family member's problem
f. unknown
g. no substance abuse problem

Ability to pay for services
a. self pay
b. Blue Cross/Blue Shield
c. other private insurance
d. Medicare/Medicaid
e. Civilian Health & Medical Program of Uniformed Service (CHAMPUS)
f. other public funds for health care
g. no ability to pay
h. other: ________________________________

Client's sex
a. Female
b. Male

d. A. Correction/Update
b. Deletion

DOCUMENT TYPE

Race/Ethnic background
a. Black
b. White
c. Hispanic ________________________________
d. American Indian ________________________________
e. other ________________________________

Current marital status
a. married
b. widowed
c. divorced
d. separated
e. single
f. refused to answer
g. unknown
h. other ________________________________

Source of referral
From a Substance Abuse Program
a. Emergency Medical Services (117)
b. Approved Service Program (1269)
c. Alcoholics Anonymous
d. Other treatment programs
e. Employee assistance program
f. Alcohol Highway Safety Program

From other areas
a. self
b. Court referral - Driving offense
c. Court referral - other
d. Police
e. Secretary of State's Office
f. Mental Health Program
g. Social Services
h. Other human service program
i. Relative/Family/Friend
j. Employer
k. School
l. Physician
m. Hospital
n. Refused to answer
o. Other ________________________________

Current employment status
a. employed full-time (over 35 hrs/wk)
b. employed part-time (35 hrs or less/wk)
c. unemployed - in work force (e.g. hired, seasonal, looking for work, etc.)
d. unemployed - not in work force (e.g. student, homemaker, retired, jail, not looking for work, etc.)
e. refused to answer