

VOCATIONAL REHABILITATION PROGRAMS FOR LEARNING
DISABLED ADULTS: PREDICTORS OF SUCCESS

by

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A Thesis Submitted to the Faculty of the
DEPARTMENT OF PSYCHOLOGY
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF ARTS
In the Graduate College
THE UNIVERSITY OF ARIZONA

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ABSTRACT

The case files of 53 State of Arizona, Department of Economic Security, Division of Vocational Rehabilitation (DVR) learning-disabled clients were examined. Data were collected on the following variables: age, sex, ethnicity, language spoken, size of family, number of dependents, highest grade attained, verbal and performance IQ, geographical area in state, dollars spent by DVR, number of rehabilitation services received, and attendance in program. These variables were examined to determine their relationship to success or failure in rehabilitation programming, with success defined by DVR as 60 days of economic self-sufficiency. A discriminant function analysis was done to determine whether a weighted composite score could accurately predict outcome status. Results were significant at the .004 level. A profile of the successful DVR learning-disabled client emerged, with such clients being younger, with more education, spending more time at their work placement, having a higher WAIS Performance IQ, and receiving less DVR dollars than their unsuccessful counterparts.

LITERATURE REVIEW

One of the earliest recorded references to learning disabilities was by H. C. Bastain (cited by Tarnopol, 1971) who described "word deafness" and "word blindness" in 1869. Word deafness referred to the inability to understand spoken words despite adequate hearing. Word blindness referred to the inability to recognize printed words despite adequate vision.

Recent diagnostic terminology for the learning disabled has passed through three separate stages (Dunn, 1973). Children were first classified as brain injured, later as having a minimal brain dysfunction, and most recently as having a specific learning disability. Strauss and Lehtinen (1947) described a particular type of brain injured child. They enumerated seven criteria for classification, four being behavioral and three biological in nature. These criteria included perceptual disorders, perseveration, thinking or conceptual disorders, hyperactivity or uninhibited behavior, slight neurological signs, a history of neurological impairment, and no history of mental retardation in the family. A child could be diagnosed as having the Strauss syndrome on the basis of the four behavioral symptoms alone.

During the 1960s, minimal brain dysfunction became the broadened label to include both the type of child described by Strauss and other children with perceptual and learning problems (Dunn, 1973). Clements' 1966 monogram, sponsored by the National Institute of Neurological Diseases and Blindness, provided the major support for use of this terminology. The monogram stated that the term "minimal brain dysfunction" should be reserved for the child whose symptomatology appears in one or more of the specific areas of brain function, but in mild or subclinical form, without reducing overall intellectual functioning to the subnormal ranges.

It is usually assumed that those children labeled minimal brain dysfunction have some kind of brain damage. This damage is not severe enough to be manifested by the usual "hard" neurological evidence, such as motor weakness, spasticity, abnormalities in sensation, or pathologic reflexes, but is marked rather by minimal "soft" neurological signs, such as clumsiness, nystagmus, and mixed or confused laterality (Gross and Wilson, 1974). Soft neurological signs, by definition, are not signs for which there is known or locatable brain damage. The diagnosis of minimal brain dysfunction from soft neurological signs results in heavy reliance on behavioral symptoms (Gross and Wilson, 1974). The observation of behavioral similarities between children with proven brain damage and those labeled

minimal brain dysfunction without proven brain damage became the primary justification for the inference of brain defect.

Sam Kirk (1962) coined the label "learning disability." This term became especially popular in the field of special education where there was a ground swell of reaction against labels such as minimal brain dysfunction that presupposed a medical etiology. Except for agreement that an organic impairment was not necessary for the diagnosis of a specific learning disability, there was not unanimity concerning the specific parameters of the condition to which it referred. Kirk's (1962, p. 263) original definition of learning disabilities stated:

A learning disability refers to a retardation, disorder, or delayed development in one or more of the basic processes of speech, language, reading, spelling, writing, or arithmetic resulting from a possible cerebral dysfunction and/or emotional or behavioral disturbance and not from mental retardation, sensory deprivation, or cultural or instructional factors.

Dunn (1973) criticized Kirk's definition because it does not contain the requirement of a discrepancy between expected and actual achievement, Knopf (1979) pointed out that if this requirement were included, then it follows logically that a retarded child can also have a learning disability in which such a discrepancy may be present. Bryan (1974) maintained that by definition a learning disabled child cannot be retarded and that many retarded

children are misdiagnosed as learning disabled. The precise relationship between hyperactivity and learning disabilities has also been a matter of debate. Knopf (1979) accused Keogh (1971) of confounding both these conditions by including hyperactivity under the general rubric of learning disabilities.

Learning disability is only one of many labels used interchangeably as a large umbrella that refers to a discrepancy between actual and anticipated academic achievement in children who otherwise are not handicapped in intelligence, sensory processes, emotional stability, or opportunities to learn (Knopf, 1979, p. 276). Knopf pointed out that there are over 40 terms used in the literature to refer to essentially the same condition. Despite the conceptual confusion and contrasting opinions, most investigators are in agreement that an important syndrome has been identified. According to Tarnopol (1971), learning disabilities now constitute the most pervasive medical problem of children in the United States, affecting between 5% and 20% of the non-retarded child population. Knopf (1979) noted that most observers agree that learning disabilities represent a large, if not the largest, referral problem in school age youngsters.

Although most agree that learning disabilities are an important problem in the school-age population, little attention has been given to the impact of those disabilities

when the child becomes an adult. According to Tarnopol (1971), the effects of learning disabilities may last from several months to a lifetime. The precise nature of these effects, however, have not been delineated for the adult learning disabled person. Longitudinal research has been rare. The most relevant pieces of longitudinal research were done by Menkes, Rowe, and Menkes (1967) and by Mendelson, Johnson, and Stewart (1971).

Menkes et al. (1967), in a retrospective study, followed up 18 patients who had been seen at a child psychiatry clinic. The subjects had presented symptoms of hyperactivity and learning difficulties. All of the subjects had IQ scores over 70 and exhibited "soft" neurological signs. The aim of the study was to determine what level of social functioning was achieved by the children as adults, and what factors were of value in predicting those outcomes. Follow-up information was obtained using interviews, neurological examinations, and psychological testing. The results revealed that hyperactivity was still present in three subjects and had disappeared between the ages of 8 and 21 in the others. Four subjects had been institutionalized as psychotic, two others were considered retarded and were supported by their families, and eight were self-supporting. Neither classification of early home environment as favorable or unfavorable, nor the amount of treatment received, was found to be predictive

of social adjustment (defined as economic self-sufficiency). The IQ score obtained at initial evaluation was found to be a major prognostic factor. All but one of the subjects who were self-supporting had achieved an IQ score above 90 (Menkes et al., 1967).

Mendelson et al. (1971) studied 83 children between the ages of 12 and 16 who had been diagnosed as having the hyperactive syndrome. Most of the subjects also exhibited learning problems. Fifty-eight percent had failed one or more grades, 57% had reading difficulties, and 70% showed poor concentration. The subjects came from mostly middle class families and had a mean IQ score of 96, with a range between 60 and 120, and a mean age of 13.4 years. Outcome data was obtained by using structured interview techniques with the mothers of the hyperactive children 2 to 5 years after the diagnosis had been given. The mothers reported that 55% of the children had improved in their estimation while 35% had not improved or had become more of a problem. It was found that a "rebellious attitude" had replaced over-activity as the chief complaint regarding the child. Eighteen of the children had long histories of lying, stealing, fighting, and destructiveness which led the authors to assert that they were likely to become sociopaths as adults. Of the total sample, 59% had some contact with the police and 18% had been before the juvenile court. The authors concluded that although some symptoms such as

overactivity and distractibility had become less problematic, while other difficulties such as disobedience and juvenile delinquency, were present at an abnormally high frequency. The authors attempted to evaluate the ability of various factors to predict good outcomes. When they compared subjects who had been labeled "improved" with those who were thought to have stayed the same or become more of a problem, they discovered that neither IQ scores, proportion of broken homes, past or present disorders in the parents, attendance of child at clinic, presence of anti-social behavior at initial evaluation, or any other criterion differentiated between the two groups.

In a more recent piece of research, Morrison (1980) reported on 48 adult patients who as children had hyperactive child syndrome. Compared to a matched control group, these adults had less education, lower work status, and a higher rate of violence and legal problems. The author proposed that the patient group's greater adult social disability may result from a failure of parental control rather than a direct effect of childhood hyperactivity (Morrison, 1980).

Robins' (1974) comprehensive longitudinal study of children referred to a child guidance clinic may be relevant in light of the findings by Menkes et al. (1967) finding that four children diagnosed hyperactive with minimal brain dysfunction were later institutionalized as

psychotic. The natural history of the sociopathic personality as described by Robins is also relevant if the frequency of anti-social behaviors found by Mendelson et al. (1971) and Morrison (1980) can be further verified. Confounding any generalization, however, is the continuing ambiguity concerning the use of such labels as "learning disabilities" "minimal brain dysfunction," and "hyperactivity."

Early in 1971, the Division of Vocational Rehabilitation (DVR) of the Arizona Department of Economic Security (1978) became interested in the problems of learning disabled adults. The Vocational Rehabilitation program is a joint federal/state program established to provide vocationally related services to handicapped individuals. Eligibility for the program is determined by the collection of diagnostic and evaluative data (i.e., medical examination, psychological examination). A mental or physical disability which is a substantial handicap to employment must be demonstrated, and there must also be reason to believe that, as a result of rehabilitation services, an individual can be reasonably expected to work. After the applicant has been determined to be eligible, the diagnostic information is used to help plan and implement a program of services specifically aimed at accomplishing an agreed upon vocational goal. Among the services that may be provided are: diagnostic and related services,

counseling, vocational training, management and supervisory services for those placed in small business enterprises, placement, reader services for the blind, interpreter services for the deaf, physical/mental restoration, books and training supplies, transportation allowance, tools and equipment, maintenance allowance, occupational licenses, and other services as required. Some of these services are conditional upon financial need. A client is terminated from services either because the basic rehabilitation goals have been achieved, or because it has been determined that the rehabilitation goals can no longer be achieved. A client is considered rehabilitated when the program of services has been completed as far as is necessary or possible, substantial services have been rendered, and/or the client is engaged in a suitable occupation which is remunerated at wages or benefits comparable to other persons engaged in similar work. The decision is made that successful rehabilitation is no longer possible for reasons such as: it becomes clear that the client's disability is so severe as to preclude successful rehabilitation: the client refuses to continue participation; the client is institutionalized; there is a lack of contact with or cooperation from the client, or adverse medical conditions.

Until 1979, the Vocational Rehabilitation Administration in the United States Department of Health, Education and Welfare (DHEW) did not have a specific diagnostic

coding for individuals with learning disabilities. This absence had made problematic the efficient servicing of individuals with this disability. The Arizona DVR was committed to providing services for learning disabled persons and so, as early as 1971, took steps to obtain approval from the Federal program for the use of a provisional coding technique to denote this group. Dr. Judson Finley (1971) Chief Psychologist for DVR, outlined the appropriateness and the importance of providing services to this group in a letter to the Vocational Rehabilitation in DHEW:

We are seeing a number of youths and adults for whom minimal brain dysfunction has created problems in learning and in personal and vocational adjustment. Vision, hearing, and the like may be intact and functioning normally, but the integrative processes are deficient producing distortion in judgment, reasoning, spatial perception and motor coordination. Such persons are often experiencing misunderstanding or punishment rather than remedial techniques. As a result, we see them as alcoholics, public offenders, behavior disorders, dropouts, etc., yet for others we see no gross behavior manifestations, simply the evident minimal brain dysfunction.

A provisional code was established officially on January 23, 1973. This action enabled DVR to begin to assess how many learning disabled persons were being served and the outcome of the rehabilitation process for learning disabled cases. The rehabilitation process for learning disabled persons and the range of services available to these persons is essentially the same as for other service groups.

The present study was undertaken in order to identify and compare factors which may be of importance in predicting success in vocational rehabilitation programming for the learning disabled. The predictor variables to be examined include several types such as demographic, program, social/economic support, and medical/psychological variables. Demographic variables to be evaluated include age, sex, geographical area in state, ethnicity, and native language. Program variables to be examined include the number of vocational rehabilitation services provided, the total amount of money spent by DVR, and attendance at programming. These variables are of particular importance to an agency such as the Division of Vocational Rehabilitation since they should reflect the impact of the program on the client. Social and economic support factors to be analyzed include number of dependents and size of family. Medical/psychological variables to be examined include verbal and performance IQ and highest grade level obtained. The relevance of IQ scores in a study of this kind was established by the research of Menkes et al. (1967).

METHOD

The procedure consisted of a review of Division of Vocational Rehabilitation case files in the Tucson, Phoenix, Sierra Vista, and Nogales offices. Individuals who had received the disability code 699-L during the period 1976-79 and whose case files were closed were included in the review. Disability code 699 refers to "other disabling diseases and conditions," and L designates the special project for the learning disabled. Cases which were classified as Closed Rehabilitated (Code 26) and Closed After Plan (Code 28) were included in the data analysis. Cases which were closed before an Individualized Written Rehabilitation Plan (IWRP) was developed were not included in the data analysis since they had not completed the standard Division of Vocational Rehabilitation application process.

Fifty-three 699-L cases were classified as either Closed Rehabilitated or Closed After Plan and were utilized in the data analysis. The subjects whose files were utilized in this study included 38 males and 15 females. This preponderance of males reflects the greater prevalence of learning disabilities among males in the general population (Rubin and Balow, 1971). The mean age for DVR clients in the study was 19.2 years, with a range of 15-49 years and a standard deviation of 5.8 years, a relatively young

sample. The average WAIS Verbal IQ for subjects in the study was 79.6. The average WAIS Performance IQ was 90.3. The cases in the study thus represent a group whose primary disability is verbal or language related. This seems to be an accurate reflection of the learning disabled population as a whole (Bryan, 1974).

An analysis of the ethnic background of the DVR clients revealed that 42 were Anglo, six Hispanic, three American Indian, and two black. The native language was listed as English for all but one client. Only three of the clients had dependents, an unusual finding even considering the mean age of the clients in the study. Fourteen of the clients did not have any secondary diagnosis, twenty-six had one secondary diagnosis, twelve had two secondary diagnoses, and one client had three secondary diagnoses. The most common secondary diagnoses were mild mental retardation, and "other character, personality, and behavior disorders." Because of the small numbers in some categories of the ethnicity, language, dependents, and number of secondary diagnoses variables, they were not included on the statistical analysis.

The principle source of data in the files for the purposes of the present study was the Case Service Report form (CSR). The CSR form for each client contained the relevant information for each of the predictor variables

being investigated, with the exception of the IQ scores and program attendance records. These variables included: age, sex, ethnicity, language, number of DVR services received, total amount of money spent, geographical location, number of dependents, number of secondary diagnoses, and highest grade attained. The IQ scores were listed in the Psychological Evaluation, and attendance in programming was recorded in reports from the placement sites.

Three types of statistical analysis were utilized in this study. Descriptive statistics are reported for both the success (Closed Rehabilitated) and failure (closed After Plan) groups. The criterion for successful rehabilitation is defined by the Division of Vocational Rehabilitation as 60 days of economic self-sufficiency. Descriptive statistics are particularly important for the present study since there were only limited data available describing the population under consideration. Chi-square was used to analyze the dichotomous predictor variables of sex, geographic location, number in family (more than five or less than five), and the number of services received (two or less, or three or greater). A discriminant function analysis was undertaken to see if a weighted composite of all variables could differentially predict success or failure.

RESULTS AND DISCUSSION

Three types of statistical analyses are presented. Means and standard deviations were presented for all non-dichotomous variables in both the success and failure groups. Chi-square tests of significance did not demonstrate an association between the dichotomous predictor variables and the criterion measure. Discriminant function analysis were able to differentiate the success and failure groups utilizing a weighted composite score and was significant at the .004 level.

Table 1 presents the means and standard deviations for all non-dichotomous variables according to their status as members either of the success or failure groups. Clients in the success group were generally younger, better educated, attended program placements more, had a higher performance IQ and had less money spent on them by DVR than did those in the failure group. There was less variability in the success group for the age, highest grade, amount spent, and Verbal IQ variables, but more variability for the Performance IQ and attendance variables.

The relationship between the dichotomous predictor variables and the criterion variable was analyzed using chi-square. These results are presented in Table 2. None of the chi squares were significant.

Table 1. Means and Standard Deviation

	Success		Failure	
	\bar{X}	SD	\bar{X}	SD
Age	17.5	1.05	22.7	5.5
Higrade	11.5	1.22	9.0	1.7
Dollars	982.00	1302.00	2521.00	1622.00
VIQ	80	9.5	79	14.2
PIQ	93	11.8	85	9.9
Days Att.	129	96.0	93	51

Table 2. Chi-square Analyses

Variable	Chi square	Significance
Sex	0.04136	0.8388
Number in Family	1.280	0.5273
Number of VR Services	2.184	0.3356
Geographical Area	0.7440	0.3884

A discriminant function analysis was done to determine whether a weighted composite of predictor variables could successfully predict outcome status. The prediction results from the discriminant function analysis are presented in Table 3.

Table 3. Discriminant Function Analysis

Outcome Group	N of Cases	Predicted Group Membership	
		Success	Failure
Success	36	31 (86.1%)	5 (13.9%)
Failure	17	11 (64.7%)	6 (35.3%)

69.8% of known cases correctly classified
 Chi square = 8.321
 Significance = .004

The ability of the weighted composite to predict outcome group membership was significant. Success was predicted more accurately than failure.

Discussion

The study indicates that a weighted composite of several predictor variables can successfully differentiate vocational rehabilitation successes and failures among learning disabled adults. The successful client is more

likely to be younger, better educated, with a higher WAIS performance IQ, better program attendance, and have less DVR money spent on his case than the unsuccessful client. None of the dichotomous variables alone were found to be significantly associated with success or failure.

These results need to be placed in the context of the system which produced the data. Numerous selection factors may have been operative. Although the overall success rate was relatively high, it is unclear how it would have been effected if all learning disabled adults who made contact with the DVR system had been included. Many clients never persevere long enough in the process to have a rehabilitation plan developed. A reasonable hypothesis might be that those who are most seriously disabled are least likely to have the patience and skill necessary to negotiate with a government bureaucracy. However, a competing hypothesis might be that the people who drop out of the process before completion have solved their problems on their own and no longer need help.

Another possible biasing factor concerns the diagnostic or classification system. As mentioned previously, the field of learning disabilities as a whole has not reached agreement on a precise set of diagnostic criteria that would clearly separate it from other disorders such as hyperactivity and mental retardation. Within the DVR system, there is even greater variability with respect to diagnosis. One

factor influencing this variability may be related to administrative policy. One can hypothesize that since the original decision to use the 699-L code was made in Phoenix, its use would be greatest there and less in more distant areas of the state. This could explain why the majority of the cases were from Phoenix, while there was only one learning disabled closed case found in Nogales. This lone Nogales case was not even diagnosed in Nogales, but rather in Tucson and the file later sent to Nogales followed the client's relocation. One can infer from this that a learning disabled adult coming to a DVR office in Nogales is less likely to receive a 699-L coding from his VR counselor than a similarly disabled person in Phoenix or Tucson. A useful piece of research which could clarify the effects of this trend would involve assessing the reliability of the use of the diagnostic coding by DVR counselors in different offices and in different parts of the state.

Questions can also be raised regarding the adequacy of some of the data presented in the case files. Missing data was a frequent problem. Since there was usually no indication of why particular bits of data were missing for particular clients, it was difficult to establish the effects of this missing data upon the study. When the data was present, there was often no way of independently establishing their veracity. For example, the program attendance records were obtained from numerous placement

sites whose dedication to record keeping may have varied widely.

Another factor needs to be taken into account before the Closed Rehabilitated coding can be taken as a measure of program effectiveness. The coding strictly represents the economic self-sufficiency outcome and has no necessary connection with the role of DVR in achieving the outcome. For example, if a client were to suddenly walk out on his DVR sponsored work placement, move to another state, and independently obtain employment there, he would be classified as Closed-Rehabilitated. The ideal condition that would need to be satisfied before making a judgment as to program effectiveness would be to have some kind of equivalent control group.

The finding that none of the factors examined individually with a chi-square analysis were significantly associated with rehabilitation outcome is not surprising given the drawbacks of the data and the complexities of the rehabilitation process. However, the success of a weighted composite score in predicting outcome group membership is an indication that the complexities of the process are capable of being analyzed. Although individual factors cannot be cited with confidence, the profile of the successful client in terms of age, education, Performance IQ, and attendance at program is highly plausible. Clients who have attained higher educational levels have already demonstrated an ability to cope

with societal demands that may serve them well in being rehabilitated to enter the working world. The fact that successful clients were younger than the unsuccessful clients, further enhances their educational achievement, since grade level attained would be expected to increase with age. The successful client's relative youth is not an unexpected result, as younger clients would be less likely to have a firmly entrenched dysfunctional learning history such as might be associated with prolonged institutionalization or exposure to the criminal justice system. The finding that a higher Performance IQ was associated with successful outcome is consistent with the findings of Menkes et al. (1967). Performance IQ may be a better prognosticator than Verbal IQ, since language-impaired persons it may best indicate general intelligence. The association of attendance at program with successful outcome is an indicator that the consistent training in vocational skills at the placement sites is important. Perhaps the most surprising finding was that those clients who receive the most costly programs are those most likely to fail. A possible explanation for this finding is that those who receive the most costly programs may be those who are the most severely disabled and thus in need of the most intensive services. Although these results are suggestive, further research is needed before definitive statements can be made on the role of the individual variables in rehabilitation program outcome for learning disabled adults.

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