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EMPLOYMENT & EARNING ANALYSIS OF THE MICHIGAN MANPOWER DEVELOPMENT AND TRAINING ACT OF 1962 INDIVIDUAL REFERRAL PROGRAM

By

Edward Benson

A DISSERTATION

Submitted to
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ABSTRACT

EMPLOYMENT & EARNING ANALYSIS OF THE MICHIGAN MANPOWER DEVELOPMENT AND TRAINING ACT OF 1962 INDIVIDUAL REFERRAL PROGRAM

By

Edward Benson

The national interest in manpower training programs during the 1962-1972 decade came about as a result of automation. The federal manpower legislation which was enacted in 1962 was designed to train the large numbers of unemployed and underemployed persons. It also provided access to the labor force for those who would be entering for the first time. The training programs were either institutional (including the individual referral or less-than-class size) or on-the-job. While a number of empirical studies have undertaken an evaluation of group training institutional programs funded by the legislation, no effective evaluation has been made of the individual referral program.

This study is based on a random sample of individuals selected from the central office files of the Michigan Employment Security Commission (MESC) for the period 1968-1972. The method of analysis is a computerized system called Automatic Interaction Dector (AID). The system, unlike most lease squares analytical programs is very flexible and allows more easily than a conventional regression program the determination of interaction effects, e.g., interaction between dependent and explanatory variables.

The first test was to determine the significance of the average number of weeks unemployed immediately prior to enrollment (dependent variable) against the following explanatory variables: age, level of education, race and sex. The second test was to determine the significance of the average wage immediately prior to training (dependent variable) against the same group of explanatory variables. The third test was to determine the significance of the average wage after training against age, level of education, race, sex, number of class clock hours, welfare status and completion of training. These tests were based on analyses of variance.

Using the null hypothesis that there is no difference between the average wage before and after training, t-tests were run to determine (a) the significance of the difference between wages before and after training; (b) the significance of the real (deflated) income after training.

The results of the study indicate the following:

1. That the average after training wage is higher than the average before training wage, and the difference is significant at the .01 level.

2. That the deflated value of the after training wage does not alter the hypothesis regarding the significance (.01 level) of the difference between the before- and after training wage. Moreover, that there is a significant increase in wage attributable to completion of training.

3. That the training program which cost an average of $3,117.36 per trainee contributed to an increase in worker employability, and

that a large percentage (81%) was employed in training-related jobs after training.

4. That the variable most significant in determining the average wage prior to training was sex: males received a higher average wage than females. On the contrary, the variable most significant in determining average wage after training was completion of training.

5. That while the training program improved the employability of the participants, there was a tendency for traditional institutional biases in the labor market to subject blacks and females to less than parity wage with their counterparts who completed the training program.

The fact that an evaluation of the Individual Referral program had not been previously undertaken might be indicative of the extent to which the role of the program had been minimized. Implicit in the program's high success is its propensity to provide an additional pool of skilled manpower for the service industry.

The success of this progrm might constitute a justification for its continuation under the new Concentrated Employment and Training Act of 1973 (CETA). CETA might than be evaluated as to its effectiveness in improving trainee employability and income. To accomplish this however, there is urgent need for improvement in client follow-up data at MESC. A limitation of this research has been the paucity of follow-up data on clients who had enrolled in the program, and therefore the results of this study may be inconclusive.

ACKNOWLEDGMENTS

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Thanks are also due the Statistical Evaluation Division of the Michigan Department of Social Services who suggested the statistical method and was instrumental in computerizing the tabulations. Special thanks are due my friend Gundy Rao whose mathematical skills were extremely helpful and to the research staff at Michigan Employment Security Commission who made the data accessible.

Special recognition is due the author's mother whose early and continued inspiration has been a beacon throughout the years.

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CHAPTER I

INTRODUCTION

The history of manpower programs over the past decade (1962-1972) has been in large measure, a record of efforts to develop and carry out programs which would have effectively trained the unemployed and underemployed, racial and ethnic minorities, young workers, older workers and women. As a provision in the Manpower Development and Training Act of 1962 and its subsequent amendments, manpower development training programs were developed to alleviate manpower shortages, lower the high unemployment rate and increase the income and employability of trainees, most of whom were affected by automation. The general scope and function of the training program has been to enhance and increase the skill level of the participants through training in various types of occupations for which they were most suited.

Accordingly, training took place either on the job, in a vocational/technical institution or community college. On-the-job training took place on the job with the federal government subsidizing the employer as an incentive to participate in the training program. Institutional training by comparison occurred in a vocational/technical institution or community college under contract with the State Department of Education. In this connection, the contract provided that the institution would provide a combination classroom/laboratory training

to enrollees who were referred to the program by the state employment service. The trainees were allowed a stipend to cover transportation and living expenses. The latter was based on family size and will be referred to later in the study.

Institutional training which was referred to earlier, is further refined to consist of regular classes and less than class size. The latter type of training was sometimes referred to as individual referral. These two will be used synonymously here.

The basic differences between regular classes and less than class size training are as follows: A) The method of referral. The method used in less than class size training was a very selective and individualized procedure carried out by the state employment services. The selected individual was directed to a community college academic rather than vocational program. B) Heterogeneity. Referral is to a facility where an academically heterogeneous group was already enrolled and taking courses related to their respective educational objectives. A less than class referral presupposed that the educational level and achievement of the trainee prior to enrollment was adequate to meet the rigorous academic demands of the institution. C) Size of the class. The number of individuals referred to less than class size programs was limited to ten trainees for each occupation. D) Length of training period. Less than class size training programs ran up to six months longer than regular classes because the enrollees were required by the institution to also enroll in courses specifically unrelated to the enrollees' occupational objectives. This meant that 16-18 months may

have been required for completion of the training under the less than class size system and approximately ten months for regular classes.

Even though manpower programs have been in existence for almost a decade, the less than class size program or individual referral system was not developed until 1968 as a supplemental effort in training individuals to compete more effectively in the labor market. No research studies have undertaken the task of determining the success of the programs in terms of increasing the income and employability of the (individually referred) trainees. Therefore, the focus of this study will be directed toward an examination in Michigan, of the individual referral system of vocational training under the Manpower Development and Training Act (MDTA) to determine (1) whether trainee incomes were increased as a result of the program; (2) characteristics of trainees who gained the most from training. The population was chosen from the files of the Michigan Employment Security Commission (MESC). In the absence, to date,[1] of any literature on the individual referral system, a review of other relevant empirical studies (Borus, 1964; Borus and Hardin, 1969; Main, 1968; Niland, 1972; Scott, 1970; Solie, 1968; Somers and Gibbard, 1968; Weisbrod, 1969) dealing with the group method of vocational training under MDTA is considered germane to this study and will be undertaken in Chapter II.

The literature will be researched further in connection with the more global context of manpower training resources. The researcher

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[1]While this study was in process, an evaluation of the MDTA Institutional Referral Program was completed by Olympus Research Corporation, Salt Lake City, Utah, for U. S. Department of Labor, June, 1972.

intends to review studies relating to (a) the legislative history of adult education in the United States as it evolved from the Smith-Hughes Act of 1914 to the Adult Education Act of 1966; (b) the important but recently broadened concept of human capital (Becker, 1964; Wood and Campbell, 1970; Schultz, 1971) and the benefits and costs of training to both society and the trainees (Garms, 1971; Christoffel, 1973; Borus, Brennan and Rosen, 1970; Barsby, 1972).

Prior to a review of the literature, the next few pages will be devoted to a brief discussion of the problem and definition of terms which will be used throughout the study.

A. Problem

The United States has always been concerned with its manpower resources dating as far back as the Northwest Ordinance of 1787 (See Figure 1) to the Nixon administration's Manpower Special Revenue Sharing proposal to Congress. Manpower researchers would be remiss if they failed to make special mention of the more recent (1960's) reincarnation, a renaissance, of national manpower thrust, the progenitors of which were the last Presidents John F. Kennedy and Lyndon B. Johnson. President Johnson's dreams of a Great Society were the imagination of a great president whose people lived in a paradox of poverty and affluence, unemployment, underemployment and high levels of industrial productivity, civil disorders within the nation and walking on the tranquility of the moon. It is out of this paradox that a series of Great Society legislation was born.

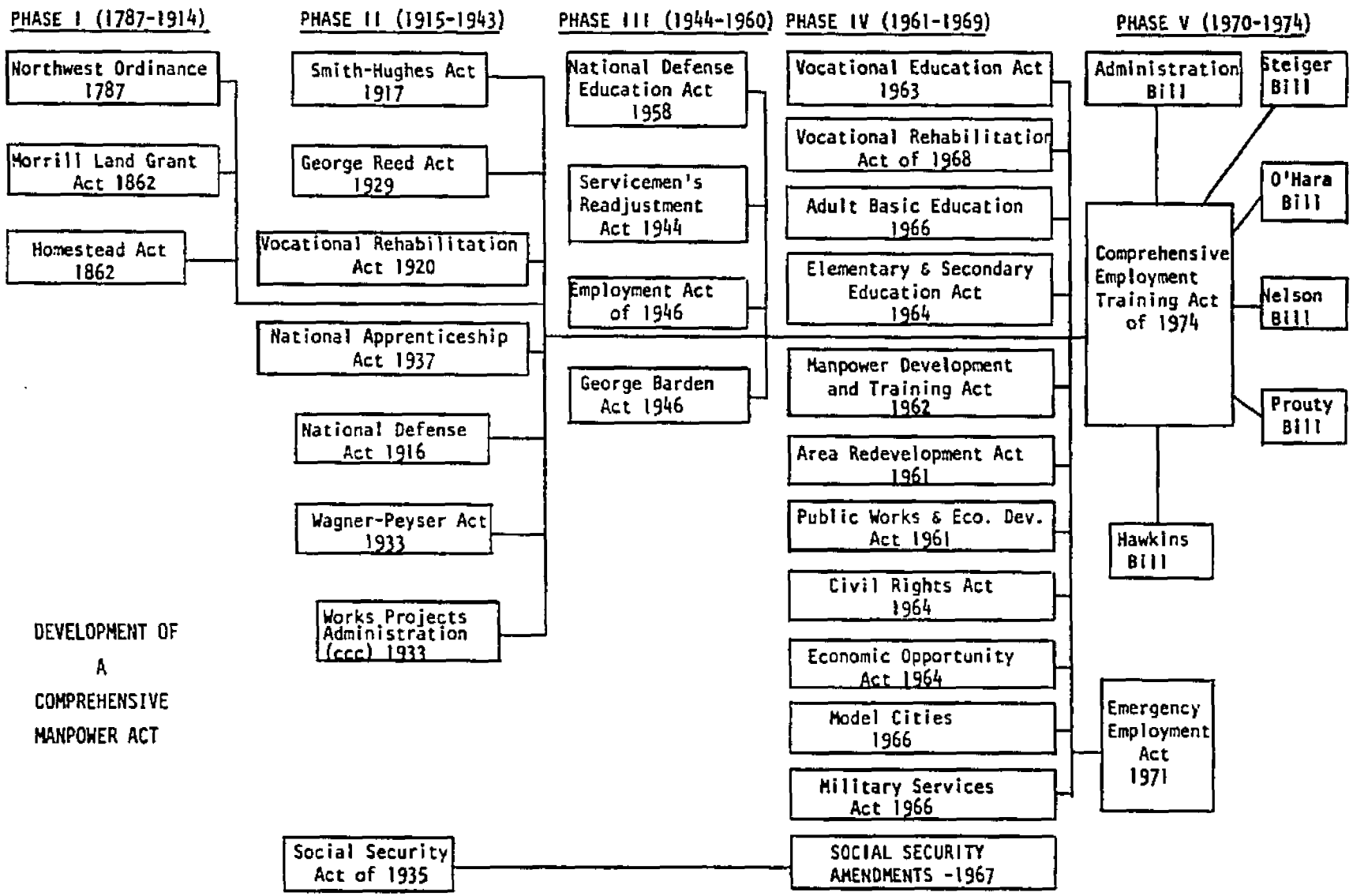

Figure 1.--Manpower Legislation 1787 - 1974.

Great Society legislation of the 1960's and their administrative guidelines were conceptualized and operationalized in swift reaction to the human resources exigencies of the period but without the mechanism for determining program effectiveness. Consequently, scientific evaluation of manpower program poses serious threat to the validity of research results and raises several questions as to whether determination of program effectiveness can at all be obtained experimentally.

This situation notwithstanding, attempts will be made in this study to discover valid evidence of less than class size effectiveness. The results could be useful to federal and state decision makers in their search for ways to improve the delivery of manpower services.

The problem is "How successful is the Less Than Class Size program in Michigan in terms of increasing the income and employability of the trainees?" Implicit in this question are those factors relative to the impact of the training on the ability of the individual to obtain a training related job, the resultant change in income commensurate with increased, salesable vocational skills, and the effects of demographic characteristics. Success of the program will be determined by (a) the ratio of completions to dropouts, (b) the number and/or percentage of graduates who are employed in training-related jobs, and (c) the significance of any wage changes as a result of graduation.

The data used in this study spans a period of three years, 1969 through 1972. The utilization of manpower data over this length of time when national and fiscal monetary policies fluctuated could pose a

serious limitation on this study. However, the effect of this constraint is negated through the use of the consumer price index (CPT) for the period to determine the real income of the participants. Borus and Tash (1970) in addressing this subject indicated that additional research is needed in this area, and indicated also that "presumably government fiscal and monetary policy are designed to achieve full employment regardless of whether a particular manpower program is implemented." In this connection, therefore, the answer to the question of time restrictions is addressed in Table 37.

A more relevant question in connection with time is the opportunity costs incurred by the enrollees. Training programs are offered based on the expectation of placement upon completion. The researcher contends that except for the General Motors strike of 1970 which had a crippling effect on employment (and revenues) time has a negligible effect on the placement of less than class size trainees in view of the length of the less than class size training (up to 18 months versus maximum 10 weeks for regular class).

In the immediate section which follows, a definition of terms is undertaken. Chapter II deals with a general survey of relevant literature, followed by the research design and methodology in Chapter III. Chapter IV is devoted to an analysis of the data and Chapter V presents the research findings, conclusion and recommendations.

B. Definitions of Terms

Manpower programs are federal programs intended to influence the quality and composition of the work force by increasing the skills and

employment opportunities of individuals in the work force, or those who desire to be in it but who are vocationally unprepared or face other barriers to employment. Therefore, programs purporting to alleviate employment barriers must provide skill training, transitional employment experience, job placement assistance, related child care, and social and health services. Toward that end, manpower programs generally: (1) operate outside the normal educational processes, (2) give supportive services for periods of less than one year, (3) provide skill training and job opportunities for non-professional jobs, and (4) target on the disadvantaged sector of the population.

The following is a list of terminology which will be used throughout the research:

Employability is the capacity to be employed as a result of receiving training.

Employment refers to a contractual relationship in which a person provides a service for which he receives wages.

Training related job is employment of a trainee in a job for which he was specifically prepared during the training program.

Trainee refers to an individual who is engaged in MDTA training programs at some point in time for purposes of improving employability.

Training is trainee enrollment in Vocational Education skill preparation class for which he benefits through increased employability and employment.

Individual Referral (IR). A state employment service system of referral to training in which an individual is selected, counseled,

tested and trained based upon the individual's background, prior education, work experience and motivation.

Less Than Class/Individual Referral (IR). Occasions exist when it is not practical to organize a Manpower Development and Training (MDT) class project for a specific occupation, but circumstances are appropriate for the inclusion of one MDT trainee, or a few, into an existing program. In these instances, where demand in an occupation is scattered and insufficient to establish a class, trainees may be referred on a less-than-class basis.

Underemployment. The term refers to a person who is working part-time but seeking full-time work or who is working full-time but receiving wages below poverty level.

Cost-Effectiveness. The level of effectiveness achieved and cost by a program as compared to the cost and achievement of a competing program.

Benefit-Cost Analysis. A financial analysis of benefits and costs of a program, often expressed as a ratio.

Opportunity Costs. Those tangible and intangible costs incurred by a worker as a result of a decision to enroll in an educational program rather than to be gainfully employed.

Consumer Price Index (CPI). A measure of changes in relative price levels of commodities normally consumed by urban wage earners. The index is calculated relative to a base period in which the price of consumer goods and services maintained a steady level without wide fluctuation.

CHAPTER II

GENERAL SURVEY OF LITERATURE

A. Legislative History of Adult Education

In Michigan, there has been a growing concern for the quality of education in the state since early 1970. This emerging concern prompted the State Board of Education to appoint an advisory task force composed of Michigan educators, students, and lay citizens. The primary purpose of the task force was to identify what was considered the common goals of an educational system capable of meeting the growing and changing needs of contemporary society.

Although it is recognized that the schools are presently meeting the needs of many people, it became increasingly important to the task force that an effort be made to focus its attention on the needs of all citizens, on the demands of present day society, and on the resources at hand. Speculatively, it is within this general context, and within the context of the manpower legislation of the 1960's that the educational resources of the state provided the coordinative thrust for achieving the common educational goals of MDTA and the state's task force.

The task force grouped its ideas into three principal goal areas which should guide efforts to perfect the educational system. These areas are: (1) democracy and equal opportunity--concerned with

conditions necessary for a successful process of school operation, (2) student learning--specifying desired outcomes for each person who is a product of the educational system, and (3) educational improvement--identifying actions that are essential to continued upgrading of the system. It might be interesting to note that Hennighen (1970) indicates that dropout statewide for elementary and secondary schools was approximately 50,000.

With reference to the task force's position on Equality and Equal Opportunity, it was felt that Michigan education must support the principles of democracy by recognizing the worth of every human being and by creating an educational environment to develop mature and responsible citizens. Toward that end, this researcher believes that the tremendous growth and expansion in this state of community colleges over the last decade or so was designed to facilitate the appropriate millieu for achieving individual and societal educational objectives. While in the past, and to a large degree today, general education was considered the bulwark of democracy, our democratic institutions are being threatened by the effects on individuals of automation and cybernation which are demanding a more specialized education.

The riots and civil disturbances of the 1960's according to the Kerner Commission Report[2] was a direct manifestation of high unemployment and inequality of educational and employment opportunities. There can be no doubt that the riots posed a serious threat to the future of

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[2]Report of the National Advisory Commission on Civil Disorders, Governor Otto Kerner, Chairman. Dutton Publishing Company, New York, New York, 1968, p. 609.

democratic institutions, a situation reversed only by the sagacity of high quality American leadership and the enactment of Great Society legislation, including educational opportunities for adults.

While general education is important for self-edification and personal gratification, adult education must be given considerable attention in this study because the thrust of the manpower programs addresses adult educational needs. Therefore, this aspect of this study is directed at a review of the history and impact of adult education legislation on basic education.

Darland (1969) cites that the history of adult education in the United States cannot be accurately addressed without referring to major legislative developments which have exerted influence on the adult education movement. Accordingly the cultural extension and home economics programs were the main thrust of adult education at the time of World War 1 and were made possible by the Smith-Hughes Act of 1917 and the Smith-Bankhead Act of 1920.

During the depression of the 1930's much of adult education action was sponsored by such federal programs as the Civilian Conservation Corps, the National Youth Administration, and the Work Project Administration. The three organizations were created as a result of anti-depression legislation.

Federal aid to education in the United States became more pronounced in the late 1950's and early 1960's and public school adult education programs were among the recipients of federal support. A brief description of federal involvement appears below.

Vocational Education Acts

Since 1917 the local-state-federal programs of vocational and technical education have been developed on the basis of grants-in-aid to the states to encourage and support vocational training (Darland, 1969). The original legislation, the Smith-Hughes Act (1914), specified agriculture, home economics, trades and industries as the occupational categories for which state and local training costs and other expenses would be eligible for partial reimbursements by federal funds. This pattern continued by designing other occupational categories in which training could be supported by federal funds.

The George-Dean Act of 1937 was a further contribution in this direction. This act was concerned with the distributive occupations. Succeeding it was the George-Barden Act of 1946 which provided for a major expansion in vocational education. Amendments in this act provided training for practical nursing and preparation in other health occupations including authorization for training in the fishery trades and industries. Later the National Defense Education Act of 1958 was enacted authorizing training of technicians in occupations necessary to national defense.

The Vocational Act of 1963 set a few patterns for federal support of vocational and technical education. It continued the previous authorization for training in specific occupational categories and added the office occupations. It further permitted states to transfer Federal funds from one category to another. More importantly, the Act brought a fresh meaning to vocational education in that

educational opportunities become available to adults in need of training, but who were no longer in the educational system.

The 1963 Act was amended in 1968 to provide more "people oriented" services. The 1968 legislation provided additional funding to promote activities such as cooperative programs, training for the disadvantaged as well as the handicapped of all ages. It also provided for consumer and homemaking education and other activities.

The primary and legal basis for vocational educational programs were the Vocational Education Act of 1963, the Smith-Hughes (1914) and George-Barden Acts (1946). Using these legislative acts as a basis for organization, the Vocational Education program was designed (1) to serve adults who needed training or retraining in order to achieve stable employment or advancement, and (2) to provide special training for persons with academic or sociometric handicaps that may prevent them from succeeding in the regular vocational programs.

As cited by Darland the Vocational Education Act of 1963 was not considered an adult education bill, although its purpose included adults. Its purpose is cited in the following paragraph:

> It is the purpose of this act to authorize federal grants to states in assisting them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the state--those in high school, those who have already entered the labor market but need to upgrade their skills or learn new ones, and those with special educational handicaps--will have ready access to vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from such training (Darland, 1967).

On November 3, 1966, Congress passed the Adult Education Act of 1966 as Title III of the Elementary and Secondary Education Amendments of 1966. It was important for a number of reasons: (1) it was considered the initial legislation enacted specifically referred to as an Adult Education Act, and (2) it moved adult education into the mainstream of education in this country regardless of student age. While a series of adult education legislation had been useful in providing educational services for adults, other federal legislation, e.g., MDTA has been useful in serving a complimentary purpose as indicated in the next section.

Impact on Other Legislation

According to the Manpower Report of the President (1972), the primary objective of the federal manpower training programs was to develop job skills in helping the unemployed, underemployed, welfare recipients, and other disadvantaged persons.

The passage of the Manpower Development and Training Act in 1962--with much broader provisions for institutional and on-the-job training--represent a worthwhile innovation. The 1961 recession had brought a new rise in a chronically high unemployment rate. Rapid technological change created fear of widespread unemployment due to automation. Fryer (1956) notes that, although there is a rapid pace of technological change, "no machine will entirely replace the human being--not only will new skills be required but the old ones will need reshaping." In addition, and perhaps more important, there are indications that as manufacturing becomes heavily automated and as unions

bargain for a shorter work week and earlier retirement, the resultant increase in leisure time will generate exponentially higher demands for service industries, including government services.

Following the passage of MDTA, fears of widespread technological unemployment lessened as a result of the strong economic expansion and a growing belief that technological advance does not necessarily imply an overall increase in unemployment.

Initial experience with the manpower training programs called attention to groups in the population not originally designated for special help--the poorly education, members of minority groups; men and women with low incomes. The MDTA was amended in 1963 and 1968 in an effort to make it a more flexible method for meeting the training needs of disadvantaged groups, those affected by automation and new entrants into the labor force.

Instruction in basic education under MDTA is usually provided through local schools. It may be conducted under contract by business, industry, trade associations, labor unions, or private education and training institutions. Sixty-two thousand trainees have been enrolled in basic education since 1962. Table 1 shows institutional trainees by occupational category for the fiscal year 1967 as reported by the Handbook of Adult Education (1970).

The cumulative enrollment nationally of the MDTA program since its inception in 1962 exceeded three million as of November, 1972.[3] Those trained in the institutional phase of the MDTA program numbered

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[3]The estimated number of trainees as of Nobember, 1972, was 3,098,900. Manpower Report of the President, March, 1973, p. 53.

TABLE 1.--Institutional Training by Occupational Category of Training, Fiscal Year 1967 (Tenn. 1970).

Occupational Category	Percent of Trainees
Machine Trades	21
Clerical and Sales	20
Structural Work	18
Service Occupations	17
Miscellaneous	23

317,800 while on-the-job phase handled 2,781,100 trainees. The Department of Health, Education and Welfare in conjunction with state education departments arranges the institutional training through public and private educational agencies. Improvement in coordination and cooperation among these agencies has been accomplished through the Cooperative Area Manpower Planning System (CAMPS), to the extent that CAMPS has been able to achieve this.

Darland (1967) notes that the greatest expansion of adult education programs in recent years has not been under the strict classification of "education" but instead under "manpower." Previous vocational education acts were not primarily aimed at the adult and was tightly targeted on school programs, whereas, the new acts did just the opposite in view of increasing skill obsolescence occasioned by automation and increasing entrants into the labor force.

Adult education became a more specific part of federal education legislation with the enactment of the Manpower Development and Training Act of 1962. The bill marked the use of the term--adult basic education.

Other provisions of the MDTA made it possible to offer occupational training programs to persons age 16 and older. It is noted that although most of the occupational training aspects of this bill came under the jurisdiction of the Department of Labor and were administered through the branch offices of the Employment Service, the educational portions of the training--adult basic education--was often conducted by adult education departments of local public school systems.

The Economic Opportunity act of 1964 (EOA) is another legislative source of funds for adult education programs. This act focuses its attention on the needs of the poor, low income families and individuals. While MDTA and Vocational Education Acts recognized that adult basic education was a necessary prerequisite for meaningful job training, neither bill recognized adult education to the extent that it was a central part of it or was it included as a separate title in the legislation. The most important emergence for adult education came as a result of the Economic Opportunity Act of 1964. Resulting from this action the Office of Equal Opportunity was created later the same year as a federal agency to administer the various anti-poverty programs.

Considerable attention seemed to be focused on Title B of the act--Adult Basic Education Programs--which stated that:

> It is the basic purpose of this part to initiate programs of instruction for individuals who have attained age eighteen and whose inability to read and write the English language constitutes a substantial impairment of their ability to get or retain employment commensurate with their real ability, so as to help eliminate such inability and raise the level of education of such individuals with a view to making them less likely to become dependent on others, improving their ability to benefit productive and profitable employment, and making them better able to meet their adult responsibilities (Darland, 1967).

Title I of the Demonstration Cities and Metropolitan Development Act of 1966 which gave birth to the Model Cities program constitutes an additional source of federal legislation for adult education programs. An objective of the education component of this Act seeks to achieve, at the local level, "marked progress in reducing educational disadvantages and to provide educational services necessary to serve the poor and disadvantaged in the areas . . . and to bring the educational performance of disadvantaged children up to levels prevailing in the community or metropolitan area and which will provide substantially all Model Neighborhood children and adults with adequate work skills and/or academic training commensurate with their ability and expressed desires" (Darland, 1967).

Toward that end, the Lansing Model Cities Agency for example has collaborated with the local school district in providing funds and inciting interests in the delivery of broader, fundamental educational services to Model Neighborhood residents. During FY 1974, the Lansing Model Cities Agency contributed $250,000 to the Lansing School District on a pilot basis for developing a career education project designed to prepare residents for vocations consistent with their individual interests, needs, and the world of work.

B. Manpower Training and Retraining Programs

According to the Manpower Report of the President (1968), manpower policy and programs had three major focuses in 1967. These foci were on the concentration and unification of manpower forces to help the nation's most disadvantaged people achieve employability and decently

paid jobs, on greatly increased efforts to involve private industry in the training and job adjustment of the hard core unemployed, and on new program developments aimed at greater flexibility in meeting the divergent needs of different individuals and groups.

A report prepared by Daniel H. Kruger (1972) reveals that available data show that there are individuals in the labor force who possess characteristics which impede or restrict their employability, e.g., lack of appropriate skills or lack of adequate schooling. Personal characteristics, lack of adequate supportive services, imperfections in the channels of hiring, and an inadequate supply of jobs all contribute to the number and rate of those unemployed in the Greater Lansing Area. This, according to Kruger, indicates the needs of individuals for both manpowr services and jobs.

Against this background of federal legislation and administrative action in support of adult education and manpower programs, this researcher intends to review some germane empirical studies on the subject of manpower training in the section which follows:

1. Economic Benefits of Manpower Retraining Programs

Page (1964) has done a somewhat inclusive cost-benefit study of retraining under the Manpower Development Act. His primary purpose was to analyze the efforts to maintain a higher level of employment in the United States by studying a retraining program under the Massachusetts State Law, providing insights into costs and benefits to be experienced under MDTA.

Data were compiled from a statistical summary of 907 trainees in Massachusetts between 1958 and 1961, who sought retraining to improve the steadiness of their employment and their incomes. With these data supplemented by information from interviews, the author proceeded with his benefit-cost analysis approach.

Page used for cost measures in his study: capital, education, subsistence and supervision. Since the trainees were charged for their use of educational materials, the real value of these educational items were used in the analysis. Subsistence costs were differential amounts, since the MDTA allows subsistence payments for families totalling the state average unemployment insurance benefit.

Page notes the observation that only 438 out of 907 retrainees obtained jobs in the areas in which they were retrained, discounting the program's assumption that the men need only retraining to get better jobs.

Hardin (1969), in his analysis of benefit-cost studies cites Cain and Stromdorfer (1969) as calculating the net present value of training to be $3,325 for men, $76 for women, and $1,638 for both sexes combined, given a 10 percent discount rate. The new present values were $3,985, $80, and $1,990, respectively, when the discount rate is five percent. The private cost is estimated to be $233 for men, $30 for women, and $165 per average graduate. These results imply benefit-cost ratios of 15.3, 3.5, and 10.9, respectively, given a 10 percent discount rate. This situation appears to emphasize a serious discrepancy and sex bias in employment practices which are currently being corrected through court action and affirmative action programs.

Borus (1964) reports present values of future benefits from $535 to $1,031 depending on the assumptions concerning the discount rate (5 or 15 percent) and the rate of out-migration from the training-related occupation. The private cost per trainee is not estimated as a single figure, but a range of possibilities is given.

Hardin and Borus (1966) calculated the annual benefits for their entire sample as $174 per trainee and a cost of $1800 per trainee, which represents a benefit-cost ratio of 5.9, given a 10 percent discount rate and a ten year service life. The average annual benefit for trainees in classes of 60-200 hours was calculated to be $745, and the cost is negative, -$56. This negative sum may be due to large transfer payments to trainees.

Cain and Stromdorfer (1969) indicated a monthly gain of $67 in net earnings plus imputed value of voluntary non-participation in the labor force for men. They indicated a corresponding monthly gain of $9 for women. These amounts imply a private benefit cost ratio of 21.2 for men and 22.1 for women, given a 10 percent discount rate and a 10 year service life.

Hardin and Borus (1966) further indicated that the government is able to collect an average of only $88 per trainee per year after training but incurs an outlay of $1,115 per trainee. The annual gain being slightly lower than 8 percent of the initial outlay, the government is not able to recover its investment of funds from the trainees, unless the discount rate is substantially less than 8 percent.

Hardin (1969) notes that the inverse relationship of benefits to course duration also appears to be present in government benefits.

A trainee in a class for 60-200 hours returns to the government an annual amount with an average of $275 after training, and the government spends only an average of $404 on him. If the service life is 10 years, cites Hardin, then the benefit-cost ratio for the government is approximately 4.2, given a 10 percent discount rate, and a benefit cost ratio of about 5.5, given a 4 percent discount rate. According to Hardin and Borus the transfer to retraining efforts from medium and long classes to short classes and a reduction in discount rate will improve the government's recovery of funds from the trainees and will have no substantial effect on the trainees.

Magnum and Robson (1971) feel that the important question is not "which manpower program has been most cost-effective in achieving its objective." Instead, it is "what combination of manpower services can make the greatest contribution to alleviate the employment problems of the disadvantaged." This researcher concurs that the social benefits and in some cases the social costs exceed the economic costs. The complexity of administrative problem is a result of the myrid manpower legislation, its sponsorship, and a fluctuating national economic and fiscal policy. Figure 2 prepared by the Manpower Program Service at Michigan State University illustrates graphically the amorphous nature of the administrative problem.

Magnum and Robson (1971) further stress that manpower programs, in addition to increasing employability for trainees, also stimulated the growth and development of experienced staff personnel with consequences for other public and private efforts. This researcher's experiences indicate that manpower programs also affect the attitudes,

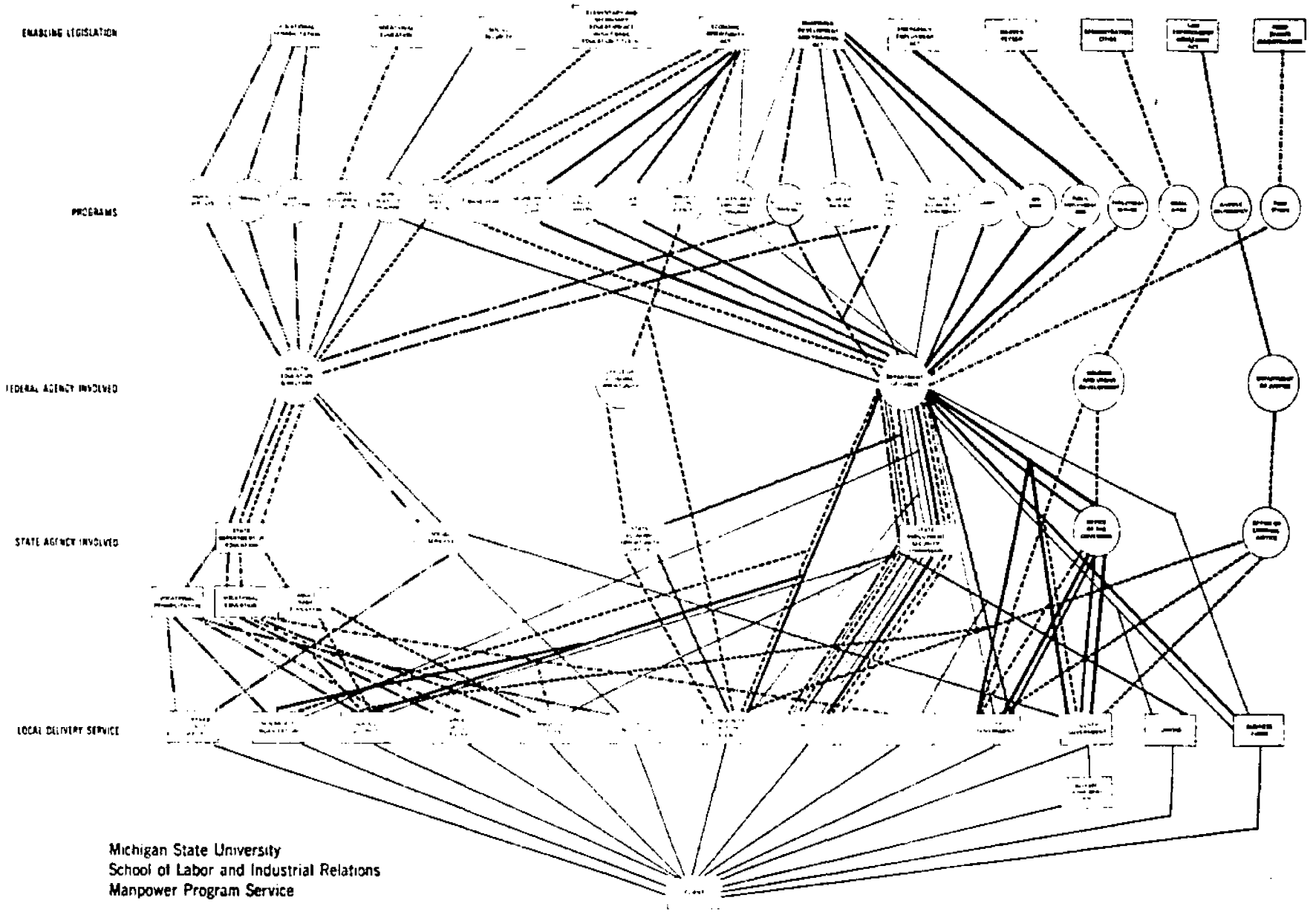

Figure 2.--Manpower Programs and Funding Patterns.

perceptions, and services of public agencies serving the poor, and develops in these agencies a greater capacity and sensitivity for delivering human services. Magnum and Robson (1971) also emphasize that in order to learn the real worth of manpower programs, one must measure their total impact on the community. Measuring the impact of a manpower program requires a before-and-after comparison, e.g., "how were these things before the manpower program and how they are now?"

Magnum and Robson (1971) feel that the critical impact of manpower programs is on the lives of the enrolless and their families. As a result of training will they experience more stable, more satisfying and better paid employment in the future? Further, will the improvement be sufficient to justify the cost? Magnum and Robson (1971) have suggested two approaches in achieving satisfied employment and earnings: (1) If the problem is the individual's lack of skill, experience, education, or motivation, program administrators would be concerned with programs designed to improve the individual's skills and attitude; (2) If the problem is manifested in the structure and functioning of the labor market, these conditions must be changed. Some of these changes may require programs designed to bridge the geographical gap between people and jobs, and to affect the labor market dynamics which restrain access.

Hamermesh (1971) cites certain secondary effects that should be considered in calculating benefits to be used in any benefit cost calculation for training programs. Positively there is a need to consider unmeasured factors as the rise in morale among disadvantaged

trainees who find employment and the generational effects upon the children of successful trainees. Negatively, a very important secondary impact of training programs is known as displacement. Unless workers are trained for jobs in which vacancies exist, the subsidies given to firms to employ disadvantaged workers result, in the long run, in the displacement of other, non-subsidized workers, and the possible long-run displacement of subsidized workers after subsidization ceases.

Hamermesh (1971) stresses that secondary effects are important for policy evaluation, e.g., political repercussions upon the programs designed to help the disadvantaged. He further stresses that the most important secondary effect of training and job information programs is the change they cause in the structure of private economic decision-making relative to the utilization of the trained, disadvantaged individual. He suggests that secondary effects of training and other manpower programs be analyzed to arrive at a correct evaluation of on-the-job training subsidies.

Although Hamermesh (1971) specifies certain positive and negative secondary effects, he adds that these secondary effects may be of primary importance for evaluation, operation and success of certain manpower programs.

Kiker and Liles (1972) have used the discriminant analysis technique to evaluate a particular retraining program, instead of the usual cost-benefit technique. The discriminant analysis allows for detection of potential failures in a manpower program. They have suggested that their results may be useful to policymakers who are concerned with new entrants and graduates of the retraining program.

This study was conducted in South Carolina during 1965 and 1966, at which 63 percent of the persons who were offered training under the Manpower Development and Training Act (MDTA) completed the program and 18 percent of the graduates were unemployed at the time of the post-training, one-year follow up.

The primary objective of this study was to present discriminate functions, based on an analysis of several demographic and economic characteristics of the MDTA applicants in South Carolina in 1965 and 1966. These characteristics were said to be of importance in classifying into distinctive groups (graduate or non-graduates) the future MDTA applicants in South Carolina. If it can be assumed that the applicants of future MDTA programs would have similar characteristics, the specific classifications may be used to aid in policy making. Kiker and Liles (1972) assert that the results of the discriminant analysis should not be used as an acceptance criterion. Individuals who would be classified as "failures" (non-graduates or unemployed graduates) are probably the ones that the retraining program are specifically designed to aid. This researcher contends that perhaps the importance of this kind of classification is to be able to recognize these individuals early in order that they may possibly complete the program or find employment as a result of proper counseling, guidance, and placement services.

The discriminant factors used in this study were based on several demographic and economic characteristics of approximately 4,600 persons. These persons were offered institutional training conducted

under the MDTA in South Carolina (1965,1966). The discriminant functions were determined for (1) graduates vs. non-graduates, (2) graduates vs. dropouts, (3) employed graduates vs. unemployed graduates, and (4) dropouts, vs. non-enrollees. Members of each category were defined by the following demographic and economic characteristics: age, sex, education, marital status, number of dependents, primary wage earner, prior weekly earnings, months in primary occupation and prior unemployment.

Resulting from data analysis, it was found that the individual had a greater probability of being a graduate if he had the following characteristics, listed in descending order of importance: (1) female, (2) below average earnings on last job prior to training, (3) more dependents than average, (4) above average in age, (5) unemployed less than 5 weeks prior to training, (6) employed a shorter period of time than average in primary occupation, (7) primary wage earner, (8) better education than the average, and (9) married. On the other hand, a general profile of the unemployed graduate may be seen in the following characteristics: (1) less education than the average, (2) was unemployed, on the average, more than five weeks, (3) had below average weekly earnings in his last job prior to training, (4) had more than the number of months in primary occupations, (5) female, and (6) married.

Stromdorfer (1968) sought to examine the benefits of retraining programs in West Virginia during the years 1959-1964. The programs studied were those established under the Area Redevelopment Act (ARA) and the West Virginia Area Vocational Education Program (AVP). The study

examines and analyzes 879 trainees, non-trainees, dropouts, rejects and those who did not report (DNR). This study is basically concerned with two significant questions: (1) does training of the unemployed pay off? If so, how much? And to whom? A second and equally important question is (2) what are the variables affecting the relative success or failure of retrained wokers in the labor market? Moreover, how do these variables affect different groups of workers exposed to retraining?

Stromdorfer (1968) considered his dependent variables as employment and earnings, and his independent variables as training status, regular occupation, age, education, sex, marital status, race, course sponsor, geographic mobility, labor market area, prior labor force experience, retraining skill, and job guarantee after training was completed. Variables which were considered as insignificant were race, marital status and sex. In his view, retraining has a positive net effect on labor market success in employment and earnings. Comparisons over an 18-month period showed that the trainees earned a net of $63, $42, $86, and $109 more per month than the non-trainees, dropouts, rejects and those who did not report, respectively.

Considering the remaining independent variables--education, sex, prior labor market experience, the study results were as expected: more years of education suggested more employment opportunities and higher earnings. Prior labor force experience facilitated better employment opportunities and more earning possibilities for trainees. With reference to sex, men were employed about 2.1 months more than women; men's earnings on net were $127 higher per month. Implications revealed that

this difference in employment and earnings were due to the variety of economic and institutional factors which are bias against women.

The Stromdorfer (1968) study showed the net effect of retraining to be positive and statistically significant at the .01 level. With respect to course sponsor, it seems that trainees in ARA[4]-sponsored courses were better off than those in AVP[5] courses. Trainees in ARA earned a greater net amount of $874 over the 18-month post training period. ARA courses required less time to complete enabling their trainees to return to the labor market sooner.

Solie (1968) measured the benefits of retraining in his study using a two-way method. The primary method was to determine the mean number of weeks of unemployment for each group over a two-year period. A second method of determining benefits of the retraining program was to calculate the mean number of weeks of employment for each group over the same two-year period. He controls for the socio-demographic differences of the individuals in the four groups by using multiple regression techniques. These variables include age, education, previous occupation, county of residence, marital status and others. Following regression, the results were evaluated by a t-test for significance.

The difference between the mean number of weeks employed by the completes when compared with the non-completes are significant at the .05 level. The difference between the mean number of weeks of unemployment of completes when compared with non-applicants was significant at the .01 level. Solie found no other differences to be important.

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[4]Area Redevelopment Act of 1960.

[5]Appalacian Vocational Program.

Solie (1968) measured these employment-unemployment differences several times over the two-year period. He generalized that the benefits of training tend to decrease over time.

Manpower literature reveals that the evaluations of manpower programs are not very old (less than 10 years) and therefore data are not yet available. As a result some less satisfactory method will have to be devised in order that more meaningful evaluations may be made. The more efficient method at present seems to be the projection of benefits for several periods while they are increasing, remaining constant, and declining (Borus and Tash, 1970). The authors take into account that the longer term projections should take mortality and labor force participation rates into account.

Hardin (1969) feels that progress has been made in estimating the economic consequences of an important manpower program from the point of view of society as a unit, of the trainee, and possibly of the government as an organization. He argues that further progress in measuring the economic benefits and costs requires a clearer definition of the social effects, especailly the choice between the productive capacity and actual output interpretations; a decision of whether to focus on effects on goods and services or to include also a consideration of transfer payments in determining the social effects; estimation of output effects from employee compensation instead of earnings; and progress in identifying and measuring any external effects of training. Similarly, a distinction should be made between the definition of private benefits and costs in terms of disposable income or other criteria, and a clear meaning of "economic effects on the government."

Borus and Tash (1970) suggested that the observed benefits be projected into the future in order to estimate the total gains of the programs. These suggestions may be made using several methods. They feel that a feasible method of accomplishing this would be to base the projection on the experience of participants in other programs. If the gains from a similar program have increased at an annual rate of 5 percent, this identical figure may be applied.

2. Economic Effectiveness of Manpower Retraining Programs

During the implementation of manpower training programs, administrators and training counselors should have some indicators of whether the applicant will remain in the program and go on after graduation to find a job. This information is useful at the outset in order to determine the extent of supportive services necessary for the applicant and to maximize economic effectiveness of the program.

In this connection, the Kiker and Liles (1972) discriminant analysis technique referred to above may be a useful predictive tool, in that it detects potential failures among the applicants. However, a more sophisticated study by Niland (1972) uses a different criterion, and is geared more toward a determination of program effectiveness than individual considerations.

Niland's (1972) primary concern was for the role of prior labor market experience in evaluating manpower programs. The present study revealed that in the first two years 1260 participants graduated from the 10-week job preparation course, based on a survey made in 1971 of

graduates, dropouts, and rejects from the program. A series of multiple regressions to determine the influence of both program and non-program factors were used. The independent variables utilized are: race, sex, marital status, the number of school grades completed, the number of other training programs attended, weekly earnings at the time of application for the program, percent time employed in the 12 months prior to application for the program, and program status, where the individual is either a graduate or a reject from the program.

Results show that race, sex, and marital status do not prove significant. The positive significance of education was expected and indicates that among graduates and non-graduates, earnings are higher as more schooling is completed. In addition, these regressions conclude that graduation is associated with greater earnings, but this is achieved only through higher paying jobs for those who previously had better jobs in the labor market prior to training. Reduced unemployment among graduates is not indicated.

Borus' 1964 study consists of a second consideration of effectiveness in manpower retraining. He weighs the benefits and costs of the Connecticut retraining programs to determine if retraining is a sound investment for the individual worker, the government, and the economy. The increase in income of workers who utilized training was primarily due to a five week reduction in their expected annual unemployment. A number of factors reduced the benefit for the worker--increased taxes, reduced transfer payments, discounting for time preference, and a tendency for the trainees to leave the retraining occupation. Borus notes that not all trainees who enter the retraining

programs make use of the skills that they have been taught. Aggregate benefits from retraining were greater than the sum of individual benefits because, as Borus notes, the value of the workers' production (the individual benefits) was increased by secondary effects, and the social rate of time preference was assumed to be lower than the individual's rate. Since the retraining allowance exceeded normal unemployment benefits, it was in the financial interest of the workers to enter the courses whether or not they planned to use the skills. The costs of retraining to the economy were the same as those to the government except for the retraining allowances which were simply transfers. For the worker who had an opportunity cost of undertaking retraining at $80 per week, the benefit cost ratio was between 3.2 and 6.2. The government's benefit-cost ratio was between 11.4 and 42.4 depending on worker characteristics and the program chosen.

3. Evaluation of Manpower Programs--Conceptual Issues and Problems

Evaluation of manpower programs is of considerable interest, although evaluations have been very slow for various reasons. Notwithstanding, Barsby (1972), Magnum and Rossi (1971), Weisbrod (1969), Rossi (1973), Borus and Buntz (1973), have all examined evaluation of manpower programs.

Barsby (1972) asserts that the magnitude of expenditures on manpower programs e.g., over $5 billion a year is sufficient justification for requiring careful evaluation of their operation. The wide range of manpower programs serving other groups, indicate that the past

years have been a period of experimentation as well as one of intensified efforts to reduce poverty.

Magnum and Robson (1971) feel that an evaluation study must answer two primary questions: (1) What was the total net impact of the entire complex of programs in each community? (2) In what ways have the differing economic, political and social environments required differing policies or influenced the relative success of failure of the program?

In this connection, Weisbrod (1969) indicates that when the benefits from particular manpower programs are being evaluated, there is a risk of overstatement since a combination of programs is employed while all the benefits are attributed to one single program.

Problems of evaluation have also been emphasized by Borus and Buntz (1972). They have provided a comprehensive review of the methodology of manpower program evaluation as well as some of the improvements which have occurred in evaluation techniques for manpower programs. The major emphasis of the present authors was devoted to studies that did not have sufficiently supporting methodology in order that manpower programs can produce worthy and reliable answers to questions concerning policy making decisions. They note that in evaluating manpower programs the majority of studies have used change in the income of the program participants as a primary dependent variable. The use of change in income as a dependent variable is justifiable for several reasons. First, most of the evaluations have taken the point of view that one goal of the manpower programs is to improve the level of aggregate production.

It is further noted that many benefits which accrue to the government from manpower programs are based on the earnings of the participants. For example, tax revenues from the participants will increase as their earnings rise (Hardin, 1969). On the other hand, social welfare and social services expenditures may decline if manpower programs are successful (Hardin, 1969). The difficulty of measuring the variables directly is considered a problem, and therefore necessary to estimate the income gains of participants in order to calculate the effects of manpower programs on government budgets.

Several major theoretical works (Borus & Tash, 1970; Stromdorfer, 1968; Hardin, 1969; Borus, 1964; Becker, 1964) have advanced a variety of approaches for choosing the appropriate discount rate for evaluating returns to government projects. Various studies have shown similarities in the choice of discount rates used in projecting the benefits of manpower programs. It is noted that two-thirds of the studies which calculate present values use a 10 percent discount rate to calculate social benefits. The similar discount rates implies--to an extent--that the findings of various manpower evaluations are somewhat comparable.

Additional issues relative to evaluation were addressed by Cain and Hollister (1973) and others. For example, Cain and Hollister (1973) contend that existing evaluations of social action programs have come short of meeting the standards possible within the disciplines of social sciences. These authors feel that existing data and methods may permit evaluations providing the rules of evidence for determining

the degree to which programs have succeeded or failed. According to Cain and Hollister (1973), it is expected that evaluation programs should be designed in a manner to reflect an experimental situation: That is, a model suitable for statistical testing, wide range in the values of the variables representing the program inputs, and the use of control groups.

In an earlier study, Cain and Hollister (1969) delineated two broad types of evaluations. The first of which is called "process evaluation," primarily concerned with administrative monitoring and the need to check on managerial functions, including the accuracy of records, etc.

A second type of evaluation proposed by Cain and Hillister (1969) is "outcome evaluation," more commonly known as cost-benefit analysis. The inputs and outcomes of the program require measurements, although the most difficult problem is deciding on the measuring of outcomes. In many cases it is possible that a project may be judged to be a success or a failure irrespective of how well it was administered.

Borus and Tash (1970) assert that past evaluations of manpower programs have taken many forms which have differed in terms of the variables considered for measuring. Consequently, they have delineated three basic types of evaluations which are a little different from those proposed by Cain and Hillister (1969), e.g., (a) program monitoring, (b) short-term feedback, and (c) impact evaluation. They have noted that one of the major problems in the evaluation of manpower

programs is that these programs encompass a wide variety of services for the nation's workers and potential workers. Generally, they seek to improve the employment situation of program participants through improving their economic, physical, and mental well-being. They seek also to increase the productive ability of the nation's human resources and to reduce poverty and social dependency. However, these goals are said to be difficult to operationalize.

Additional problems in manpower evaluations may serve in referring to the question of "whom do manpower programs affect?" Borus and Tash (1970) feel that many studies have excluded--because of lack of data or theoretical basis--many persons whose labor market experience was influenced by manpower programs.

C. Theory and Application of Cost-Benefit Analysis and Investment in Human Capital

1. Human Capital

The concept of human capital has long been looked upon (paradoxically) as a means of reducing man to a mere material component and impairing the freedom which man has long sought for himself. The effect of indentured slavery in the United States, and the rise of colonialism elsewhere are the main reasons that man was not considered a form of capital. Moreover, as certain liberal, emancipation forces began to appear on the political and economic horizons, the notion of human capital became further unthinkable and unhumanitarian. According to Nicholson (1891) even J. S. Mill at one time insisted that "people of a country should not be looked upon as wealth because wealth existed

only for the sake of people." Alfred Marshall somewhat supported Mills' view, and indicated that "while human beings are incontestably capital from an abstract and mathematical point of view, it would be out of touch with the market place to treat them as capital in practical analysis (Marshall, 1930).

On the contrary, supporters of the concept of humans as capital according to Nicholson (1891) include the philosopher-economist Adam Smith who boldly included all of the acquired and useful abilities of all inhabitants of a country as a part of capital. H. Van Thuemen also argued that the concept of capital as applied to man did not degrade or impair his freedom and dignity.

The stream of thought, therefore, has been that it is neither appropriate nor practical to apply the concept of capital to human beings. This situation appears to have been generally accepted, or at least remained within the realm of philosophical discussions until Schultz (1961) in his presidential address spoke of the birth of the economics of education at an Annual Meeting of the American Economic Association. He indicated that the acquisition of useful skills and knowledge is a form of capital, that this capital is a substantial product of deliberate investment and that its growth in Western societies may well be the most distinctive feature of the economic system.

Indications are that since Schultz's speech, the economics of education and health have become rapidly growing branches of economics, and which during the last 13 years have silently revolutionized traditional subjects such as growth economics, labor economics,

international trade and public finance. It is within this general framework that the following section dealing with the theory and application of cost-benefit analysis and investment in human capital is reviewed.

Human capital is an important concept in relation to cost-benefit analysis and has been elaborated in the literature (Schults, 1961; Becker, 1964).

Becker (1964) has gathered extensive data concerning investment in human capital development with specific emphasis on effects of earnings, rates of return; rates of return from college education, under investment in college education; rates of return from high school education and trends over time. He has delineated the various forms of investments in human capital to include schooling, on-the-job training, medical care, migration, and information. He feels that most investments in human capital raise observed earnings at older ages because returns are a part of earnings. Becker further feels that because these effects are produced by very different kinds of investment in human capital, a basis is provided for a unified and comprehensive theory. Such a theory may help to explain different phenomena, such as inter-personal and inter-area differences in earnings, the shape of age-earning profiles, and the effect of specialization on skill. Some investments in human capital do not affect earnings because costs are paid and returns are collected by firms, industries, or countries employing the individuals involved. These are considered "specific investments," according to Becker (1964). He views "specific

training" as training which has no effect on the productivity of trainess in any firm other than the one providing the training; general training increases the marginal productivity of trainees by the same amount in other firms as in the firm providing the training. Specific training is said to help in explaining that unemployment is greater among unskilled than skilled workers, and sometimes for restricting worker mobility among older workers for whom returns to investment in training would not be optimal.

Becker (1964) further investigates empirically the effect of investment in formal education on earnings and productivity in the United States. He examines such areas as: the relationship between earnings and college education as measured by its effects on national productivity, private rates of return from high school education; the effects of the increase in education upon earnings differentials and emphasizes the age-earnings profiles caused by investment in education.

2. Investment in Human Capital

According to Schultz (1961) much of what is referred to as consumption constitutes investment in human capital--expenditures on education, health, and internal migration to take advantage of better job opportunities. He indicates that economists have long been aware that people are important for the wealth of nations. The productive capacity of human beings is said to be larger than all other forms of wealth taken together. Economists stress that people invest in themselves and that these investments are usually very large, especially if foregone earnings or opportunity costs are taken into consideration.

However, these investments enlarge and extend the range of options available to individuals. The researcher's multi-disciplinary background might be a case in point.

Schultz (1961) notes that the thought of investment in human beings is offensive. "Values and beliefs inhibit us from looking upon human beings as capital goods--except in slavery--and this we abhor." It seems that we are unaffected by the long struggle to rid society of indentured service and to evolve political and legal institutions in an effort to avoid bondage for free men. To use human beings as investment runs counter to strongly held values, and tends to reduce man to a material component, to something very similar to property.

The failure to treat human resources as a form of capital, as a means of production, as a product of investment, has fostered the retention of the classical notion of investment, and has fostered the retention of the classical notion of labor as a capacity to do manual work requiring little knowledge and skill.

As cited by Schultz (1961) human resources have both quantitative and qualitative dimensions. The number of people, the proportion who enter upon useful work, and hours worked are essentially quantitative characteristics. It is noted that many insights may be gained by examining some of the more important activities that improve human capabilities. He concentrated on 5 basic categories: (1) health facilities and services--all expenditures that affect the life expectancy, strength and stamina, and the vigor and vitality of a people;

(2) on-the-job training--old style apprenticeship organized by firms; (3) formally organized education at the elementary, secondary, and higher education levels, (4) study programs for adults that are not organized by firms--extension programs especially in agriculture; (5) migration of individuals and families to adjust to changing job opportunities. Schultz admits that not much is known about these activities except for education. He fails to elaborate on these activities in any detailed manner.

3. The Economics of Investment in Human Resources

While discussing aspects of investment in human capital, it is of equal importance to integrate into this discussion the economics of investment in human resources. The most distinctive feature of our economic system is the growth in human capital.

Marglin (1967) describes benefit-cost analysis as a tactical rather than a strategic weapon in economic development. In order for benefit-cost analysis to fulfill this role, economic planning must proceed through successive stages for setting objectives, allocating resources among sectors, and deriving criteria for designing individual projects. The goal of project design is the maximization of net benefits under constraints. The meaning of "benefits" and "costs" depend on the program's objectives. The problem of comparing benefits with respect to different objectives is similar to the problem of comparing benefits in different years: in both, weights are used; in the latter case the discount rate is the weighing system. The marginal internal

rate of return in the private sector is not an appropriate rate of discount for the public sector because there exists no means of which the economy as opposed to the individual can divorce the decisions of choosing an investment program and distributing consumption over time. A value judgement about the inter-temporal distribution of benefits must be incorporated into the investment criteria. While the present criteria is recommended for inter-temporal comparisons, it may lead to errors in the timing of projects when benefit rates increase over time.

In this connection, Marglin (1967) introduces a criterion which may be applied in a relatively wide variety of such cases. Risk aversion is not necessarily the appropriate attitude for a government: primarily, a government should concentrate on expected values instead of worrying about the dispersion of outcomes. Secondary benefits are defined separately for each objective as indirect contribution not reflected in the direct consumption of goals and services produced by public enterprises.

4. Public Resource Development

Whereas, Marglin (1967) is concerned with the descriptive nature of benefit-cost analysis, Ciriacy (1955) is concerned with the public policy aspects of benefit-cost analysis. Ciriacy (1955) favors the use of benefit-cost analysis as a guide to public investment in resource development for two main reasons: (1) it is likely to restrain the abuse of economic arguments in the political process, and (2) it

may provide a stimulus to research and scientific understanding. It is suggested that intangibles such as recreational opportunities may be evaluated through indirect use of market data. However, most indirect and secondary benefits and costs are evaluated directly in the market place, although it is not certain as to what extent they will be considered and added to direct benefits and costs. Ciriacy (1955) examines secondary benefits and costs in view of his analysis. He feels that all classes of secondary net benefits should be dropped from consideration if the problem area is project selection.

D. Specific Application of Benefit-Cost Analysis

Sewel, Davis, Scott and Ross (1961) have outlined the general principles and procedures of benefit-cost analysis. Among the practical difficulties considered are the problems of pricing, project life, discount rate, secondary effects and intangibles, damages and compensation, employment taxes, and conflicts between resource use. The authors have outlined procedures for evaluating benefits in the following areas: flood control, hydroelectric power, fisheries improvements, domestic and others. The sample case relates to the economic merits of alternative hydroelectric projects.

Rossi (1972) in his study has concerned himself with the analysis of social policy. The essential elements of cost-benefit analysis are considered in the following assertion: rational decisions among alternative policies may be accomplished by ordering all alternatives in terms of the balances or ratios between anticipated costs and the

anticipated benefits of the policies in question. The benefits of a particular policy alternative are the anticipated want fulfillment patterns made possible by the proposed change.

In view of the above, it is noted by Rossi (1972) that the key problems in cost-benefit analysis center around (a) a determination of goals; (b) a reduction of want-fulfillment patterns; (c) identification of costs and benefits; (d) identification of alternatives and (e) the development of a mechanism by which to aggregate costs and benefits to determine the distribution of well-being in a social system.

Benefit-Cost Analysis of Occupational Training Programs

Subsequent to Schultz's (1961) revolutionary treatise on investment in human capital, the massive state of unemployment that existed during the early 1960's, and the burgeoning effect that Schultz's treatise has had on the state of the art of economics, a proliferation of economic studies relative to investment in human capital and its impact on manpower training has occurred. A leading study in this area is that of Hardin (1969), which is concerned with a comparison of recent studies on benefit-cost analysis of occupational training programs.

His comparisons are focused on occupationally oriented, institutional training of adult learners. These workers are usually, but not especially, unemployed or underemployed. Other studies which are

included in Hardin's research (and referred to earlier) are the West Virginia retraining courses studied by Somers (1968), and results of economic benefits and costs published by Gibbard and Somer (1968), Cain and Stromdorfer (1968), and Stromdorfer (1968). A report by Solie has been published regarding ARA retraining in Tennessee (1968). Also, Borus has analyzed a state-sponsored and ARA retraining in Connecticut (1964). Page and Gooding have studied state-sponsored retraining in Massachusetts (1962). Hardin and Borus (1966) have evaluated ARA and Manpower Development and Training Act (MDTA) retraining in Michigan.

The main focus of Hardin's (1969) analysis was on those studies which resulted in complete benefit-cost ratios. He gave slight but considerable attention on analysis concerned primarily with other important economic aspects of the retraining process.

Hardin (1969) begins his research analysis within a conceptual and methodological framework. He emphasized various definitions of "benefits for society" and has sought to compare, contrast, and analyze these various perspectives. According to him, benefit-cost analysis of occupational training may be undertaken from three different perspectives: Society as a whole, the individual trainee, and the government as an organization. In this connection, Page (1962) defines the social economic benefits for society as the sum of the growth in trainee earnings and the decline in trainee transfer payments which occur after the course and are attributable to it.

The economic costs of society consist of the sum of the rental of private instrumental facilities, and the operating costs of

instruction together with other expenditures. There appears to be a philosophical difference between the authors with respect to the components of benefits and costs. Toward that end, Cain and Stromdorfer (1968) define the benefits as the increase in trainee earnings resulting from training, while Borus (1964) defines the benefits as the aggregate increase in earnings in society, including an allowance for multiple effects, which results from retraining.

Hardin and Borus (1966) define the benefits from retraining as the increase in trainee earnings occurring after the course and as a result of it. An idea common to all of these concepts is that an individual's earnings measure his contribution to production and that the impact of training upon national product may be concluded from the impact of training upon earnings. Twoard this end, a number of researchers (Wiseman, 1965; Weisbrod, 1969; Conley, 1969; Borus, Brennan and Rosen, 1970; Levin, 1970; Somers and Stromdorfer, 1971; Christoffel and Clio, 1973) have contributed to the literature of benefits and costs of occupational training. Programs researched were Upward Bound, vocational rehabilitation and Neighborhood Youth Corps (NYC) with their respective impact on the transfer payment alternatives to investment in manpower training.

Summary of Literature Review

In the sections above, an attempt has been made to look at the literature relative to the genesis and development of manpower training programs. It is interesting to note that the concept of

investment in human capital which appears to take its earliest genesis with traditional economic theoreticians, e.g., Adam Smith, Alfred Marshall, etc., over four centuries ago did not become pertinent until 1960 when Schultz (1961) discussed the economics of education and human capital formation as a means of improving the quality of the labor force.

What's more interesting is the fact that so-called benevolent politicians and orthodox economists eschewed human capital when the concept involved a relatively small, particular group of people, because it resembled slavery and relegated the human being to a merchandise which could be bought and/or sold. However, as the impact of automation replaced large numbers of workers for whom the job had assigned additional favored status in the social system, and as more of these workers lost their places in the economic mainstream of society, the concept of investment in education and human capital took on significant political proportions and emerged in the 1960's as a full-blown discipline in its own right.

Following very closely upon the emergence of the economics of investment in human capital was the massive amounts of federal dollars and manpower programs which had been legislated for the purpose of ameliorating the impact of automation and for retraining the vast pool of human resources needed to maintain and continue national economic growth. Varying degrees of success has been claimed by the administrators of the manpower programs. While the question of rate of return continues to be debatable among researchers, the effects of the

government investment appears to be successfully reducing the rate of unemployment and, at least from this researcher's point of view, is restraining the transfer payment alternatives to investment in manpower training.

Implicit in the question of program success is the question of cost-effectiveness and the appropriate measurement for it. Some authors (Magnum and Robson, 1971) have attached a greater significance to "how things were before the manpower program and how they are now." Others (Borus and Hardin, 1969) advocate the measurement of program impact beginning with the end of the first year after training and continuing at six-month intervals over a period of time. A third group of researchers (Kiker and Liles, 1972) looked at what was called discriminant analysis techniques of potential failures. Notwithstanding these differences in philosophy relative to cost-effectiveness of manpower training, the overriding concern of the administrator should be directed toward accomplishing the stated objectives of the legislation and the particular training program.

Other areas of considerable interest were demographic and other characteristics of trainees, e.g., sex, prior labor force experience, levels of education and earnings after training. For the most part, a subtle variety of economic and/or cultural factors were biased against women which resulted in longer periods of unemployment after training, and at lower wages.

The researcher's interest is considerably aroused by labor economists (Borus, 1964; Borus and Hardin, 1966; etc.) concern with

the cost-effectiveness of manpower programs. He agrees with Magnum and Robson (1971) who feels that the important question is not which manpower program has been most cost-effective in achieving its objective, but rather, what combination of manpower services can make the greatest contribution to alleviate the employment problems of the disadvantaged. Indeed this is a crucial question, one that more adequately and appropriately reflects the basis for the creation and expansion of the manpower legislation of the 1960's. This is the question which must be addressed by administrators of manpower programs, realizing that the instruments for measuring the impact of social programs should not be based exclusively on a set of economic criteria. An important measurement of program effectiveness would be the extent to which program administrators can bridge the gap between people and jobs and, according to Magnum and Robson (1971) and "affect the labor market dynamics which restrain access."

The question of worker displacement following the cessation of government subsidy to industry was, according to Hamermesh (1971) a potentially serious problem. Hamermesh (1971) felt that unless workers were trained for jobs in which vacancies existed, the subsidies given to firms to employ disadvantaged workers resulted in the long run, in the displacement of other, non-subsidized workers, and the possible long-run displacement of subsidized workers after subsidization ceases.

This researcher takes issue with Hamermesh (1971). It appears that he felt that industry was pressured into hiring the disadvantaged.

This was not the case. On the contrary, the high unemployment of the early 1960's which gave rise to MDTA of 1962 was occasioned by automation and a reduction in labor market transaction. Concomitantly, the propensity of consumer to spend was reduced due to high unemployment.

It might be concluded therefore, that industry might have employed the disadvantaged in view of potential gains to industry and not due to coersion by government.

This researcher found the Kiker and Liles (1972) discriminate analysis technique for evaluating programs interesting, and thinks it is more objective than the several cost-effectiveness models advanced by other researchers. The discriminate analysis allows for detection of potential failures, and suggests that programs be structured to assist the individuals to graduate and find jobs through proper counseling, guidance and placement services. It is to be regretted, however, that the study failed to include race among the characteristics of the participants.

Finally, researchers caution against overstating the benefits of training. Indication is that a combination of programs is employed in effectuating training but the benefits are often attributed to one. Moreover, trainee income is likely to be different from non-trainee due to greater job placement efforts on behalf of trainees, and that analysis of benefits and cost must be undertaken from the point of view of society as a whole, the individual trainee, and government.

In the next chapter, a design and methodology of the research is established by which to measure changes in income of the trainees

as a result of the training program, and the statistical significance of the change. Also, an attempt will be made to identify those variables which make the greatest impact on the employability of the trainees.

CHAPTER III

RESEARCH DESIGN

The general scope of the individual referral program is to provide the adult learners the opportunity to achieve their occupational objectives. The program allows the individual the flexibility of obtaining academic credits and a vocational skill. The trainees' motivation, prior labor force experiences and (for the most part) high school completion are the distinguishing features of the program as compared with trainee characteristics of other MDTA programs.

The individual referral program was initiated in Michigan in 1968 as a part of the national thrust in manpower development. The respective vocational classes is limited to ten enrollees. They attend classes at the training institution nearest to their home through contractual arrangements with the Michigan Employment Security Commission (MESC). Where market demand for a particular occupation warrants it, class sizes are not restricted, and the occupational training is offered without preconditions of motivation, prior labor force experience or high school completion.

This study is undertaken to determine the effectiveness, in Michigan, of the individual referral program in terms of its enhancement of trainee employability and change in earnings during 1968-1972. The hypothesis is that there were positive changes in trainee incomes

after training, and that these changes are significant. The study is also designed, using a clustering method as described in the statistical method below, and in Figures 5, 6, and 7 to determine the extent to which institutional racial and sex bias among other variables might affect employment and earnings before and after training.

A. The Sample

A random sample of 500 or 25 percent individual referral (IR) trainees was selected from the 1968-1972 total trainee population of 2058 who had enrolled in Michigan MDTA. This large sample was believed justified due to the small population which, under more favorable circumstances, e.g., budget and time, might have justified a study of the entire population.

However, in view of serious constraints which appear to be a characteristic of retrospective research,[6] the response[7] from the original random sample of 500 was used as the basis of the analysis in this research.

Therefore, the size of the sample used in this study was 140 or seven percent of the population of 2058. This sample size was based

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[6]Hardin, Einar and Michael E. Borus. Economic Benefits and Costs of Retraining Courses in Michigan. MSU, East Lansing, Michigan, 1969, p. iv. Also Hilda N. Barnes, Finding and Interviewing the Hard to Locate: The DMI Experience. Evaluating the Impact of Manpower Programs. Proceedings of a Conference Conducted June 15-17, 1971. The Center for Human Resource Research, The Ohio University (mimeographed) and Celia Homans. Finding the Hard to Locate: The NORC Experience.

[7]Zuwaylif, Fadil, General Applied Statistics, Addison-Wesley Publishing Company, Massachusetts 1970, p. 114.

on the number of individuals in the original random sample of 500 for whom complete, useful data was available within the budgetary and time constraints imposed by the research.

The individuals in the sample were enrolled in classes held during FY 1968 through FY 1972 (July, 1968-June, 1972).

B. Data Collection

The data collection process consisted of obtaining information pertaining to individual characteristics of the 140 individuals in the sample from the Detroit central office files of the Michigan Employment Security Commission. The data was obtained from forms MA-101, MA-102 and from MA-103 for those who reported employment status and earnings after training was completed (See Appendix B, C, and D).

Where the data on MA-103 was incomplete or unavailable several months were spent contacting the individuals (as far as the researcher was able to locate them) by telephone. This task was so time-consuming and monumental (due to the high mobility of the individuals and their suspicions of the nature of the follow-up) that the decision was made to terminate the follow-up after 90 days, and to use the 140 responses as the sample on which to base the research findings. Data relative to training costs and allowances, e.g., transportation, dependency, etc., was obtained from MA-103 forms.

The demographic and earnings data was coded on Data Layout sheets and punched onto IBM cards for analysis. Existing general statistical routines used by the Statistical Evaluation Division of the

Michigan Department of Social Services were used to edit and analyze the data.

C. Statistical Method

AID, an acronym for Automatic Interaction Detector[8] was used. AID is a computer program designed to provide information about the distribution of a dependent variable and its relation to several explanatory variables. Unlike most least squares analytical programs, it is very flexible--that is, it assumes very little about the shape of the distribution of the explanatory vairables, neither that they are properly scaled nor whether their effects on the dependent variables are additive.

The technique of investigation is both searching and sequential; it searches for structural relationships between a dependent variable and selected explanatory variables separately, allowing one to answer the question, "Once this first explanatory variable has been accounted for, does the second one matter?"

The sequential procedure looks at one explanatory variable at a time; it also ascertains whether explanatory variables have an effect over the entire sample or over small defined subgroups.

AID allows more easily than a conventional regression program the determination of the existence of interaction effects.

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[8] F. M. Andrews, J. N. Morgan and T. A. Sonquist. The Detection of Interaction Affects--A Report on a Computer Program for Selection of Optimal Combinations of Explanatory Variables. Institute for Social Research. The University of Michigan, Ann Arbor, Michigan, 1964.

Based on the above, this research has identified the dependent variables under consideration in the analysis as income, employability and employment. Income is a central and predominant factor being determined, e.g., change in income after completion of training.

Employment and employability are also factors to be addressed and are analyzed by relating various explanatory variables to employment and employability. The independent variables are age, sex, level of education and race. These variables play an important part in determining the degree by which an individual's employability is enhanced. Analyses of variance, using the AID computer process, is undertaken to determine the set of variables most important in predicting outcomes at an .05 degree level of significance.

The statistical computations for employability were not limited to trainees who completed the program, but also included the drop-outs as well, both of whom are subsumed under the general category of completion. The researcher feels confident with this assumption because 94 percent of the individuals in the sample completed the program. Moreover, drop-outs are considered as having completed the course, in the sense that their performance on the job and income are said to be improved as a result of having enrolled in a training program (Borus and Tash, 1970).

In order to determine the significance of the change in wages after training, a t-test of the average earnings was undertaken. Moreover, the effect of inflation during the period of the study was tested. The results are reported in Table 37. The null hypothesis is that

there is no difference between the average wage before and after training.

In Chapter IV which follows, the demographic and cost data which had been gathered from the files of MESC and telephone follow-up will be tabulated and analyzed for the purpose of determining final results.

CHAPTER IV

ANALYTICAL FRAMEWORK

A. Measuring Changes in Price--Note on Consumer Price Index

The recent history of the United States economy shows a continuing concern among consumers, bankers, labor union officials, and government officials, about the rising level of prices. Discussions about prices generally depend upon a measure known as the Consumer Price Index (CPI) for factual support. The consumer Price Index calculated and reported by the Bureau of Labor Statistics has a single purpose--to describe relative changes in the general level of prices over time. In other words, the principal purpose of an index of prices is to measure relative change in prices over time for some relevant group of goods and services and for some relevant group of purchasers. The group of relevant consumers for the purpose of this study comprise basically urban wage workers of several categories already specified.

The consumer price index is intended to measure changes in the relative price levels of commodities such as food, rents, clothing, automobiles, etc., that are normally consumed by urban wage earners. Normally, these indices are calculated with reference to a base period or normal year, or period in which the prices of consumer goods have maintained a steady level without wide fluctuations. The consumer

price index is also calculated for different classes of items of consumption so that price movements can be compared between different categories of goods and services. Consumers know, however, that goods and services do not remain constant over time because of changes in technology, skills, educational levels, job information opportunities, environmental conditions or the workplace, etc.

Inasmuch as real goods and services cannot be held constant over time, the implicit assumption made in the calculation of price indices cannot be true in a rigorous sense. Some economists have argued vehemently in recent years that the slight inflation (rate or level of change in the price level) observed in recent years is a statistical mirage, e.g., that improvements in the quality of goods and services may completely compensate for the observed increase in price. Unfortunately, it is impossible to prove or disprove this argument empirically. One can only state or conclude that the consumer price index tends to overstate an increase in the price level of some items of goods and services.

B. Measurement of Real Income --Real Purchasing Power

The measurement of changes in prices over time provides important descriptive data about the economic system, but any questions of measuring welfare must take into consideration changes in income as well as changes in prices. One basic measure of general welfare is real income--the physical amount of goods and services consumed. The measurement of real income, again, cannot be precise but only

approximate due to limitations on measurement of prices over time. Also, real income cannot be measured directly because the units of measurements are not homogeneous among goods and services. One can, however, consider that income can be expressed in terms of generalized purchasing power called real income, defined as the ratio of actual income to the consumer price index for any specified class of goods and services. However, as pointed out earlier, these measures of welfare in terms of real income undoubtedly understate the actual increase in welfare during the periods covered because of the failure of consumer price index to measure the effects of an improvement in technology, quality of education, improvement in skill levels, physical incentives on the job, urban transit growth, changes in the social structure, employment growth in the public sector, demand and supply of skill labor force, etc.

Notwithstanding some reservations with respect to the capacity of the consumer price index to adequately measure the true effect of changes in price levels, it is important that the effect of inflation on the wage change of the trainees in this research be tested. The results are indicated in Table 37.

In this section of the research, the demographic characteristics of the 140 trainees in the sample and cost data are tabulated. Also, graphical presentations of the analyses is presented using the AID method as described in Chapter III above. The graphical presentation for the average number of weeks unemployed (Figure 5) is derived from the computer print-out in the appendix. Computer print-out for

Figures 6 and 7 are also included in Appendix A. Finally, the null hypothesis is tested to determine the significance of the after training earnings.

C. General Characteristics of the 140 Trainees

The characteristics of the Michigan individual referral (IR) trainees and areas of program preferences based on the results of the sample indicate an interesting amalgam of individual characteristics, program enrollment areas and cost. In the sections which follow, the data relative to these elements are presented.

Age

On the basis of the sample, the age of the IR trainees ranges from age 15-60 (see Table 1 and Figure 3) with an average age of 32 years and a median age of 30 years.

TABLE 2.--Sample of Age Grouping of IR Trainees in the Michigan MDTA Program.

Age	Frequency	Percentage
15-19	1	0.71
20-24	46	32.86
25-29	23	16.43
30-34	17	12.15
35-39	21	15.00
40-44	12	8.57
45-49	7	5.00
50-54	9	6.43
55-60	4	2.85
TOTAL	140	100.00

The highest percentage (32.85%) falls in the age group 20-24 and the lowest percentage (0.71%) falls in age group 15-19. Relatively high percentages (16.43 and 15.00) appear between the ages 25-29 and 35-39 respectively. Figure 3 is a graphical representation of age distribution for the population.

The sample does not show enrollment after age 60; it does indicate one entry (0.71%) in the age group 15-19.

Sex

The sex make-up of the program enrollees indicate a substantially higher enrollment for females than for males. Table 3 indicates that of the 140 individuals in the sample, 109 or 77.86 percent were females, and 31 or 22.14 percent were males.

TABLE 3.--IR Enrollment by Sex

Sex	Frequency	Percentage
1 - Female	109	77.86
2 - Male	31	22.14
TOTAL	140	100.00

Education

A significantly large percentage (82.14%) of the sample completed the 12th grade whereas ten percent completed grades 8-11 and seven percent experienced some college study.

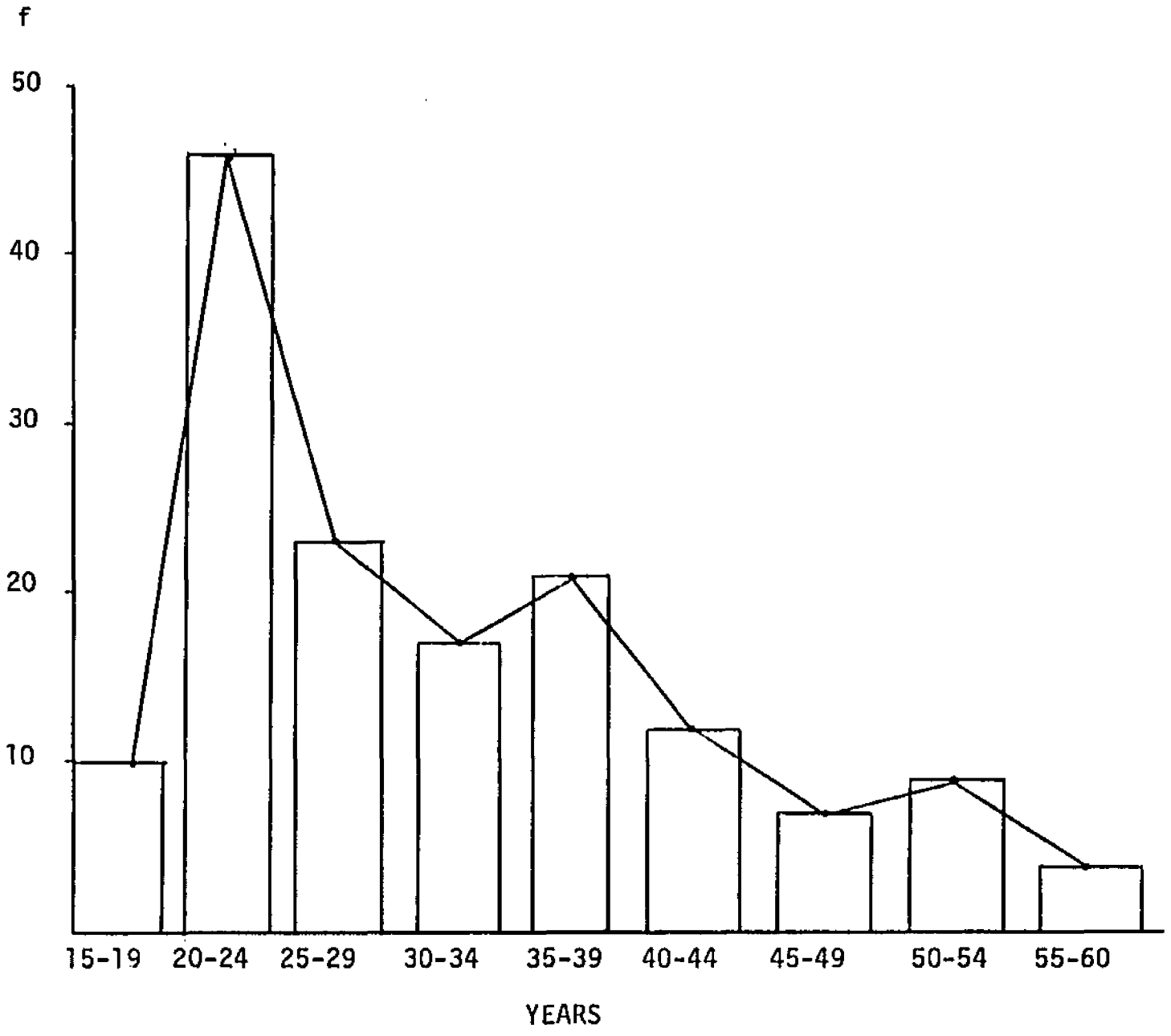


Figure 3.--Age Distribution of Trainees.

TABLE 4.--IR Trainees According to Percentage of Educational Level Completed.

Educational Level	Frequency	Percentage
8th Grade	1	0.71
9th Grade	2	1.43
10th Grade	6	4.29
11th Grade	5	3.57
12th Grade	115	82.14
13th Grade	11	7.86
TOTAL	140	100.00

Race

A majority (65%) of the trainees were white followed by a relatively large percentage (30%) black and five percent other, including Indians and Orientals.

TABLE 5.--IR Trainees by Race.

Race	Frequency	Percentage
White	91	65.00
Black	42	30.00
Mexican American	0	0.00
Other	7	5.00
TOTAL	140	100.00

The next six tables (Tables 6-11) represent a cross-tabulation of the following variables: age, sex, race and level of education. Tables 6, 7, and 8 cross-tabulates these variables, using the female as the independent variable, and tables 9, 10, and 11 uses the male as the independent variable.

Table 6 indicates a distribution of white females (N = 73), their ages and levels of education. The table shows that no white females were enrolled whose age was less than 19 years or more than 59 years; 28 white females were between ages 20-29; 32 while females were between ages 30-44, and 13 white females were between ages 45-50 years.

TABLE 6.--Level of Education (Grade Level), White Females.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	60 and Over	
1-8	0	0	0	0	0	0	0
9	0	0	0	1	0	0	1
10	0	0	0	1	1	0	2
11	0	0	2	0	0	0	2
12	0	0	26	27	11	0	64
13	0	0	0	3	1	0	4
TOTAL	0	0	28	32	13	0	73

TABLE 7.--Age, Level of Education (Grade Level), Black Females.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	60 and Over	
1-10	0	0	0	1	0	0	1
11	0	0	1	0	1	0	2
12	0	1	20	5	1	0	27
13	0	0	1	0	1	0	2
TOTAL	0	1	22	6	3	0	32

TABLE 8.--Age, Level of Education (Grade Level), Other Females.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	60 and Over	
1-12	0	0	2	1	0	0	3
13	0	0	0	0	0	0	0
TOTAL	0	0	2	1	0	0	3

Of the 73 white females in the sample, a majority (64) had completed the 12th grade, one the 9th grade, two the 10th, two the 11th, 64 the 12th and four had completed grade level 13.

Table 7 shows a distribution for black females (N = 32), their age and levels of education.

One black female was enrolled between ages 15-19 years, 22 between ages 20-29 and three between ages 45-59. Further, a majority (27) of the black females indicated an educational level of 12th grade.

With respect to grade level, one black female was reported to have completed the 10th grade, two the 11th grade, 27 the 12th grade and two grade level 13.

Table 9 indicates white males (N = 18), their ages and educational level. The table shows that eight white males were enrolled in the training program whose ages were between 20-29 years, eight between the ages 30-44 years, two between the ages 54-59 years. No white male trainees were enrolled whose ages were either less than 19 or more than 59 years. A considerable number (11) white males trainees were in the 12th grade.

With respect to grade level, one white male had completed the 8th grade, two the 10th grade, 11 the 12th grade, and 4 had completed grade level 13.

TABLE 9.--Age, Level of Education (Grade Level), White Males.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	65 and Over	
1-8	0	0	0	1	0	0	1
9	0	0	0	0	0	0	0
10	0	0	0	2	0	0	2
11	0	0	0	0	0	0	0
12	0	0	6	4	1	0	11
13	0	0	2	1	1	0	4
TOTAL	0	0	8	8	2	0	18

TABLE 10.--Age, Level of Education (Grade Level), Black Males.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	65 and Over	
1-9	0	0	0	1	0	0	1
10	0	0	1	0	0	0	1
11	0	0	1	0	0	0	1
12	0	0	2	2	1	0	5
13	0	0	1	0	0	0	1
TOTAL	0	0	5	3	1	0	9

TABLE 11.--Age, Level of Education (Grade Level), Other Males.

Grade Level	Age						Total
	0-14	15-19	20-29	30-44	45-59	60 and Over	
1-12	0	0	4	0	0	0	4
13	0	0	0	0	0	0	0
TOTAL	0	0	4	0	0	0	4

Table 10 shows black males, (N = 9), their ages and level of education. The table indicates that five black males were enrolled in the training program whose ages were between 20-29 years, three between 30-44 years, and one between 45-59 years. A majority (12) of the black males had completed the 12th grade.

With respect to grade level, one black male enrollee had completed the 9th grade, one the 10th, one the 11th, five the 12th and one

the 13th. Again there were no black male enrollees who were reported as being more than 59 years old.

Public Assistance

Table 12 below indicates that some of the trainees (19.28 percent) were receiving some sort of public assistance (at the time of enrollment in the training program) e.g., payments from the adult and family categories of the Social Security Acts, unemployment benefits, etc.

TABLE 12.--Public Assistance Recipients Enrolled in IR Program.

PA Recipient	Frequency	Percentage
Yes	27	19.28
No	112	80.00
Unknown	1	.71
TOTAL	140	100.00

Some individuals who did not qualify for public assistance payments were either the chronically unemployed or were engaged in low skilled, low paying jobs.

D. Training

Training enrollment data for the IR trainee sample covers the period 1968-1972. Table 12 shows that the greatest percentage (35.7%) of trainees enrolled during fiscal 1970-71. Why the reasons for this

increase is unspecified, one might speculate that the increased enrollment in training is related to the General Motors strike during the autumn of 1970.

TABLE 13.--IR Training Enrollment by Years of Enrollment.

Fiscal Year	Frequency	Percentage
68-69	11	7.86
69-70	44	31.43
70-71	50	35.71
71-72	35	25.00
TOTAL	140	100.00

The second highest (31.4%) enrolled during fiscal 1969-70, and the third largest enrollment (25.0%) occurred in fiscal 1971-72. The smallest percentage (7.86%) of enrollment occurred during fiscal 1968-69.

Type of Training

The type of training offered under MDTA (institutional) is always determined according to market demand in the particular locality. Table 14 represents a listing of occupations offered under the individual referral program as obtained from the 140 individuals in the sample.

TABLE 14.--Type of Training of IR Sample by Frequency and Percentage, 1968-72.

Training	Frequency	Percentage
Stenographer	6	4.29
Secretary	8	5.72
Medical Secretary	4	2.86
Typist	2	1.43
Bookkeeper	3	2.14
Clerk-General and Other	1	.71
Junior Accountant	8	5.72
Accountant Clerk	1	.71
Medical Assistant	8	5.72
Licensed Practical Nurse (LPN)	60	42.85
Barber	9	6.43
Cosmetologist	8	5.72
Truck Driver	1	.71
Tractor Trailer Truck Driver	3	2.14
Auto Mechanic	1	.71
Mechanical Technician	1	.71
Digital Computer Programmer	3	2.14
Operating Engineer	9	6.43
Miscellaneous	4	2.86
TOTAL	140	100.00

As shown, the greatest percentage of trainees in any single category were trained in the Licensed Practical Nurse area (LPN), (approximately 43%). Percentages in the remaining categories range from 1% to 6%. Areas which appear to be less appealing to the trainees consists of the following: Truck Driver (.71%), Auto Mechanic (.71%),

Accountant Clerk (.71%), Mechanical Technician (.71%), and Clerk-General (.71%).

Table 15 below represents a breakdown of type of training preference by level of education.

TABLE 15.--Level of Education (Grade Level), Type of Training.

Type of Training	Grade Level							Total
	0-7	8	9	10	11	12	13	
Stenographer	0	0	0	1	2	3	0	6
Junior Accountant	0	0	0	0	0	8	0	8
Secretary	0	0	0	0	0	8	0	4
Medical Assistant	0	0	0	0	0	7	1	8
Barber	0	0	0	2	0	7	0	9
Cosmetologist	0	0	1	1	1	4	1	8
Truck Driver	0	0	0	0	0	1	0	1
LPN	0	0	0	1	1	53	5	60
Tractor Trailer Truck Driver	0	0	0	1	0	2	0	3
Auto Mechanic	0	0	0	0	0	1	0	1
Typist	0	0	0	0	0	2	0	2
Bookkeeper	0	0	0	0	0	0	3	3
Accountant Clerk	0	0	0	0	0	1	0	1
Digital Computer	0	0	0	0	0	2	1	3
Mechanical Technician	0	0	0	0	0	1	0	1
Operating Engineer	0	0	0	0	0	7	2	9
Clerk-General and Other	0	0	0	0	0	1	0	1
Miscellaneous	0	1	0	0	0	2	1	4
TOTAL	0	1	2	6	5	115	11	140

The table indicates that 115 enrollees out of the sample of 140 or 82 percent had completed the 12th grade of which 46 percent (53) were enrolled in the licensed practical nursing (LPN) course.

Completion of Training

A critical aspect of the MDT program is the likelihood of enrollees to drop out as opportunities for employment arise, or as trainees' career goals shift. For instance, a cursory look at some of the trainee data revealed a number of reasons for dropping out, e.g., marriage, relocation, maternity, individual instability, etc.

Notwithstanding, Table 16 below indicates that 94 percent of the enrollees completed the training, and only a relatively small percentage (6%) dropped out.

TABLE 16.--Number and Percentage of IR Trainees Completing Training in the Sample.

Completed Training	Frequency	Percentage
Yes	131	93.57
No	8	5.72
Unknown (Missing Data)	1	.71
TOTAL	140	100.00

Employment Status

An analysis of the sample data before and after training revealed a significant percentage of the trainees were generally

unemployed before training. For example, prior to training, 54 percent of the trainees were unemployed and 40.7 percent were underemployed, while only 4.3 percent were employed.

The relatively large (54%) percentages unemployed and underemployed (40.7%) before training appears to be adequate justification for instituting training programs, with a view to improving the employability and increasing the income of these individuals.

Table 17a is a tabular representation of the employment status of trainees prior to enrollment in the training program.

TABLE 17a.--Employment Status before Training.

Employment Status	Frequency	Percentage
Unemployed	76	54.29
Employed	6	4.29
Underemployed	57	40.71
Other (Missing Data)	1	.71
TOTAL	140	100.00

Further to the research objective of ascertaining the impact of the training program on the employability of the trainees, Table 17b indicates the employment status of enrollees after training. In comparison with 17a above, Table 17b below reflects an increase (92 percent) in employment after training, as compared with 4 percent prior to training. Also, underemployment dropped from 40 percent prior to training as compared with 1.43 percent after training.

TABLE 17b.--Employment Status after Training.

Employment Status	Frequency	Percentage
Unemployed	5	3.57
Employed	129	92.14
Underemployed	2	1.43
Other (Missing Data)	4	2.86
TOTAL	140	100.00

A condensed view of Tables 17a and 17b is presented in Tables 18a and 18b.

Table 18a below shows the employment status of trainees before and after training for those who completed the training program.

TABLE 18a.--Employment Status Before and After Training--Completed Training.

Employment After Training	Total	Employment Before Training	Total
Unemployed	3	Unemployed	3
Employed	126	Employed	126
Underemployed	1	Underemployed	1
Other	2	Other	1
TOTAL	132	TOTAL	132

The table shows that a considerable number of enrollees who completed training and who were either unemployed or underemployed before training became employed after training.

Table 18b represents employment status before and after training for those enrollees who did not complete the training program.

TABLE 18b.--Employment Status Before and After Training--Did Not Complete Training.

Employment After Training	Total	Employment Before Training	Total
Unemployed	2	Unemployed	2
Employed	3	Employed	3
Underemployed	1	Underemployed	4
Other	2	Other	0
TOTAL	8		8

The table indicates that eight trainees did not complete the program but some of them were able to obtain employment, possibly as a result of enrollment in the program. This possibility is borne out by Borus and Tash (1970).

Table 19 is an assessment of the program's success in meeting the objectives of the MDT legislation. The table indicates that 81 percent of the trainees acquired jobs that were skill related and 13 percent acquired jobs which were not skill related.

TABLE 19.--Number of Percentage of Skill Related Employment.

Skilled Related	Frequency	Percentage
Yes	114	81.43
No	19	13.57
Unknown (Missing Data)	7	5.00
TOTAL	140	100.00

These results represent an improvement in Page's (1964) study in which training enhanced the employability of only 51 percent of the trainees.

E. Wages Prior to and After Training

Additional statistics of interest in this research is the wages before and after training. Table 20 shows the average monthly wage in the last full-time job held prior to training. The average monthly wage was computed at $302.36, with a median income equal to $285.99.

TABLE 20.--Average Monthly Wage in Last Full-Time Job Held.

Wage	Frequency	Percentage
Less than $49	10	7.14
50- 99	1	.71
100-149	1	.71
150-199	2	1.43
200-249	29	20.71
250-299	37	26.43
300-349	18	12.86
350-399	13	9.29
400-449	11	7.86
450-499	7	5.00
500-549	6	4.29
550-599	2	1.43
600 and above	3	2.14
TOTAL	140	100.00

It is shown (Table 20) that the highest percentage (26.4%) of trainees earned between $250 to $299 per month on the last job held before training, although a considerable percentage (60%) representing three income groups, earned between $200 to $349 per month. Moreover, only 10 percent of the trainees earned less than $199 prior to enrollment. An additional 26 percent spread out among four income groups received incomes between $350-$549, and a relatively smaller proportion (3%) were earning between $550 to $650 prior to training (see Figure 4).

An analysis of wage change after training suggests rather interesting results. The effect of inflation during the 1968-1972 period was tested by converting actual income to real income. This was accomplished by deflating the actual income through the use of the Consumer Price Index (CPI) for the period covered. The test was carried out to determine the significance of the difference in wage before and after training.

The results indicated that despite deflation, the significance was maintained, e.g., the previously computed value t - 6.15 without deflation compared favorably to the deflated value t = 2.30. The significance in the former case (undeflated incomes) is far higher than 1% level of significance, where in the latter case (deflated or real incomes) the effect is reduced, but the significance is still close to the 1% level. The increase in wages after training is presented in Table 21 on page 82.* Of those earning above $650/month,

*See Table 37 for Real Income Distribution.

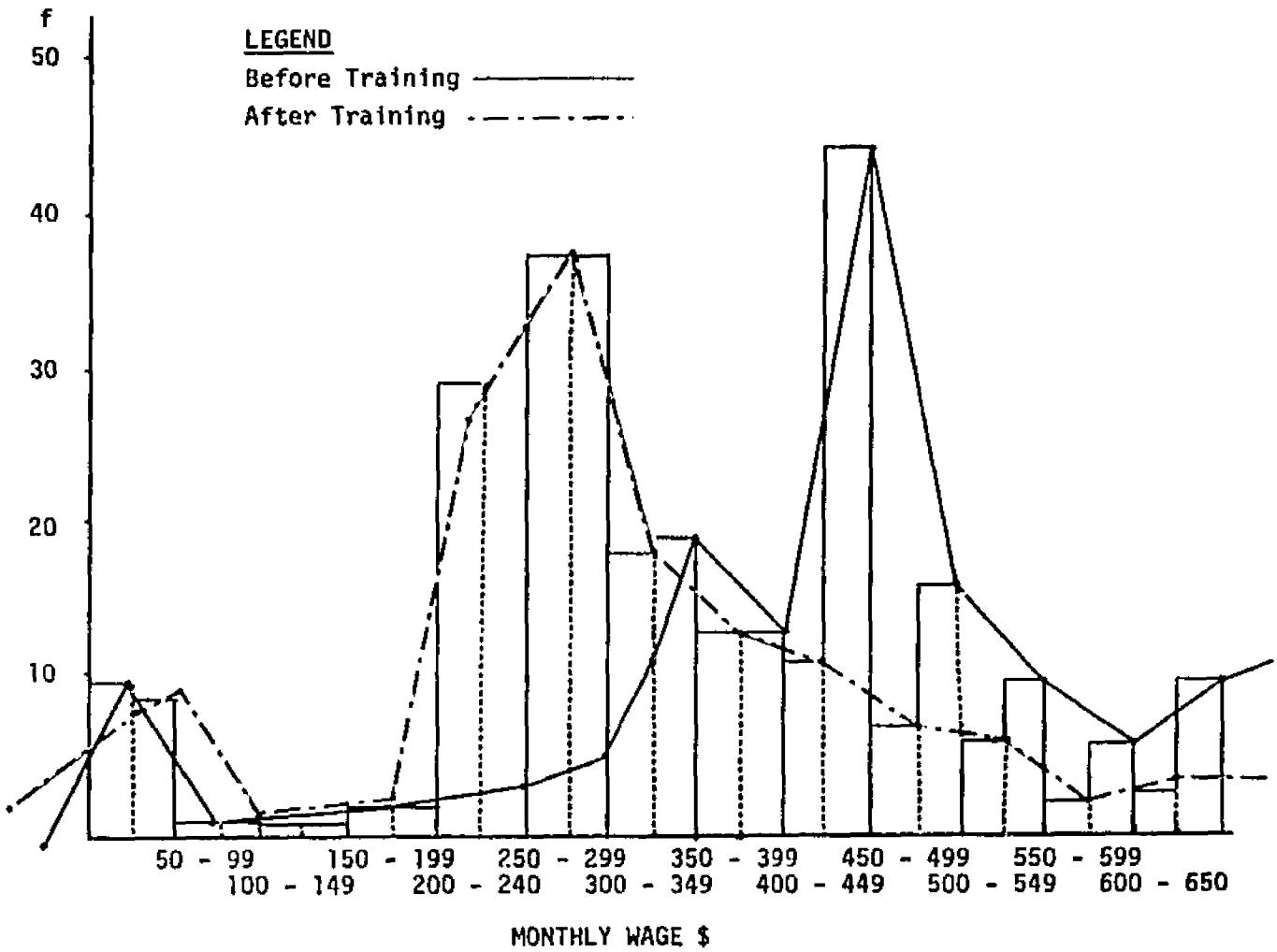


Figure 4.--Income Distribution Before and After Training.

one earned $650-699, two earned $800-$849, one earned $850-$899 and one earned above $1.000. Notwithstanding, the average increase from $302.36 per month before training to $396.00/month after training represents a wage increase of approximately 24 percent as a result of training. The median income amounted to $418.00.

TABLE 21.--Monthly Wage in Fulltime Job Held After Training.

Wage	Frequency	Percentage
Less than $49	9	6.43
50 - 99	1	.71
100-149	2	1.43
150-199	2	1.43
200-249	3	2.14
250-299	5	3.57
300-349	19	13.57
350-399	13	9.29
400-449	44	31.43
450-499	16	11.43
500-549	10	7.15
550-599	6	4.29
600 and above	10	7.13
TOTAL	140	100.00

Note: Average Monthly Wage = $396.00
Median Wage = $418.00

A further review of employment status after training indicates that of the 27 welfare recipients in the sample, 21 were employed after training, one was underemployed and two were in "other" category, e.g.,

at home with the children. With regard to 112 non-welfare recipients in the sample, their employment status after training reveals that 107 were employed, two were unemployed and one was underemployed.

A summary of increase (or decrease) in wage and their corresponding percentages according to the 20 occupational categories in the IR program is presented in Tables 21-23 below for welfare recipients and non-welfare recipients respectively.

TABLE 22.--Percentage Increase of Welfare Recipients' Wages Based on Average Monthly Wage and Occupation of those Before and After Training.

Type of Training	Before	After	Difference Before-After	Percentage Incr. or Dec.
Stenographer	286.00	320.00	34.00	11%
Junior Accountant	262.00	360.00	98.00	37%
Secretary	118.00	320.00	202.00	171%
Medical Secretary	200.00	336.00	136.00	68%
Medical Assistant	272.00	448.00	176.00	64%
Barber	192.00	264.00	72.00	38%
Cosmetologist	--	--		
Truck Driver	--	--		
LPN	249.00	456.00	207.00	83%
Tractor Trailer Truck Driver	--	--		
Legal Secretary	--	--		
Auto Mechanic	--	--		
Typist	200.00	800.00	600.00	300
Cashier Wrapper	--	--		
Bookkeeper	400.00	480.00	80.00	20%
Accountant Clerk	--	--		
Digital Computer Programmer	--	--		
Mechanical Technician	--	--		
Operating Engineer	253.00	239.00	-14.00	5%
Clerk-General and Other	--	--		
Miscellaneous	--	--		

TABLE 23.--Percentage Increase of Non-Welfare Recipients' Wages Based on Average Monthly Wage and Occupation of those Employed Before and After Training.

Type of Training	Before	After	Difference Before-After	Percentage Inc. or Dec.
Stenographer	357.00	442.00	85.00	24%
Junior Accountant	305.00	410.00	105.00	34%
Secretary	285.00	359.00	74.00	26%
Medical Secretary	263.00	356.00	93.00	35%
Medical Assistant	288.00	458.00	170.00	59%
Barber	230.00	367.00	137.00	60%
Cosmetologist	275.00	430.00	155.00	56%
Truck Driver	400.00	457.00	57.00	14%
LPN	281.00	439.00	158.00	56%
Tractor Trailer Truck Driver	253.00	640.00	387.00	152%
Legal Secretary	00.00	.00	.00	0
Auto Mechanic	499.00	694.00	195.00	39%
Typist	00.00	336.00	336.00	100%
Cashier Wrapper	00.00	.00	.00	0%
Bookkeeper	232.00	360.00	128.00	55%
Accountant Clerk	324.00	480.00	156.00	48%
Digital Computer Programmer	480.00	635.00	155.00	32%
Mechanical Technician	204.00	150.00	-54.00	26%
Operating Engineer	239.00	433.00	194.00	82%
Clerk-General and Other	480.00	382.00	-98.00	20%
Miscellaneous	558.00	426.00	-132.00	23%

TABLE 24.--Percentage Increase of Welfare and Non-Welfare Recipients' Wages Based on Average Monthly Wage After Training and Type of Training of Those Employed After Training.

Average Monthly Wage of Welfare vs. Non-Welfare Recipeints					
Type of Training	Welfare Recipient	Non-Welfare Recipient	Difference Non-Welfare --Welfare	Percentage Inc. or Dec.	
Stenographer	320.00	442.00	116.00	36%	
Junior Accountant	360.00	410.00	50.00	14%	
Secretary	320.00	359.00	39.00	12%	
Medical Secretary	336.00	356.00	20.00	6%	
Medical Assistant	448.00	458.00	10.00	2%	
Barber	264.00	367.00	103.00	39%	
Cosmetologist	--	430.00	430.00	100%	
Truck Driver	--	457.00	457.00	100%	
LPN	456.00	439.00	-17.00		4%
Tractor Trailer TD	--	640.00	640.00	100%	
Legal Secretary	--	--			
Auto Mechanic	--	694.00	694.00	100%	
Typist	800.00	336,00	-464.00		58%
Cashier Wrapper	--	--			
Bookkeeper	480.00	360.00	-120.00		25%
Accountant Clerk	--	480.00	480.00	100%	
Digital Computer Programer	--	635.00	635.00	100%	
Mechanical Technician	--	150.00	150.00	100%	
Operating Engineer	239.00	433.00	194.00	81%	
Clerk-General and Other	--	382.00	382.00	100%	
Miscellaneous	--	426.00	426.00	100%	

F. Labor Force Status

Table 25 below indicates the number of weeks IR trainees were unemployed prior to enrollment. It is shown that the greatest percentage (37%) were unemployed one week prior to enrollment in the training program; 12.9 percent were unemployed four weeks prior to enrollment. Less than one percent (0.71) were unemployed 17 weeks prior to entering the training program.

TABLE 25.--Weeks Unemployed Prior to Enrolling in Class.

Weeks	Frequency	Percentage
Less than 1	45	32.14
1	52	37.14
2	17	12.14
3	4	2.86
4	18	12.86
5	3	2.15
17	1	.71
TOTAL	140	100.00

To summarize the labor force status of these enrollees, one would have to conclude that a majority (69%) of the enrollees entered the IR training program within a week after becoming unemployed.

Hours Worked After Training

The data presented in Table 26 below indicates the average number of hours worked by trainees after completion of the training program.

TABLE 26.--Average Number of Hours Worked Per Week After Training.

Hours	Frequency	Percentage
0 - 9	15	10.72
10 - 19	2	1.43
20 - 29	3	2.14
30 - 39	1	0.71
40 - 50	119	85.00
TOTAL	140	100.00

It should be noted that the majority (85%) of the graduates worked full-time ranging 40-50 hours per week. Approximately 3.6 percent worked 10-39 hours per week, but a relatively larger percentage (10%) worked up to nine hours per week.

G. Class Cost

The cost of the training program is based on several variables, e.g., (1) the contract cost of the training institution; (2) academic equipment and supplied directly related to the trainees' needs; (3) transportation and subsistence allowances for the trainees, etc. Institutional costs are paid by the State Department of Education directly to the training institution, and subsistence allowance, paid by the employment service, is paid directly to the individual on the basis of number of dependents. Transportation cost, where applicable, is also paid directly to the individual by the employment service.

Table 27 represents the basis on which subsistence allowance is paid. For individuals on public assistance, the allowance is

TABLE 27.--Training Allowance.

Number of Dependents	Basic Amount of Regular Training Allowance	Amount Added by Number of Dependents	Regular Training Allowance Payable During First 10 Weeks of Training	Amount Added After Completion of 10 weeks of Training	Regular Training Allowance Payable Beginning With 11th Week of Training
0	60	0	60	10	70
1	60	5	65	5	70
2	60	10	70	0	70
3	60	15	75	0	75
4	60	20	80	0	80
5	60	25	85	0	85
6+	60	30	90	0	90

added to our subtracted from public assistance payment, but the recipient receives whichever amount is the higher, but within the average allowance schedules established for unemployment insurance recipients.

The aggregate cost of the training program is presented in Table 28. It is shown that a majority (24.3%) of the trainees were enrolled in classes costing between $3500 to $3999, a considerable number (16.4%) enrolled in classes costing between $4000 to $4499.

TABLE 28.--Costs of Class.

Costs	Frequency	Percentage
$ 0 - 499	8	5.71
500 - 999	8	5.71
1000 - 1499	10	7.15
2000 - 2499	11	7.86
2500 - 2999	8	5.71
3000 - 3499	11	7.86
3500 - 3999	34	24.29
4000 - 4499	23	16.43
4500 - 4999	5	3.57
5000 - 5499	4	2.86
5500 - 5999	3	2.14
6000 - 6499	3	2.14
6500 - 7499	1	.71
	140	100.00

Trainees seem to be somewhat evenly distributed among cost intervals falling in the $0-3499 range. Average cost of training was computed to be $3,117.36.

Additional interest with respect to class cost is the cost of the respective training programs. The highest costs for classes were for Bookkeeping, Junior Accountant, Licensed Practical Nursing (LPN), Stenographer, $5,216.00, $3,692.00, $2,992.00, $2,900.00 respectively.

H. Class Clock Hours

Table 29 below summarizes the range of clock hours spent in the training programs.

TABLE 29.--Average Class Clock Hours.

Class Clock Hours	Frequency	Percentage
0 - 299	18	12.87
300 - 499	5	3.57
500 - 699	6	4.29
700 - 899	8	5.71
900 - 1099	12	8.57
1100 - 1299	11	7.85
1300 - 1499	26	18.57
1500 - 1699	23	16.43
1700 - 1999	10	7.14
2000 - 2199	21	15.00
TOTAL	140	100.00

While no attempt was made to determine the specific number of hours spent in each program, the tabulation indicates that the largest percentage (18.6%) of individuals were enrolled in programs requiring 1300-1499 hours. The second largest percentage (16%) was enrolled in programs requiring 1500-1699 hours. A smaller percentage (15%) was enrolled between 2000-2199 hours, and 12 percent of the trainees were enrolled 0-299 class hours. The remaining 37 percent was distributed across the remaining number of class clock hours in the table.

I. Analysis of Variance

Analyses of variance, using AID was run to test the interaction effect of several dependent and independent variables, and to determine the level of significance of the outcome.

The first test centered around testing the interaction effect and the significance of the number of weeks unemployed (dependent variable) against the following explanatory variables: age, level of education, race, and sex. The sample mean and standard deviation were computed accordingly and presented in Table 31.

A graphical illustration of the interaction of variables as carried out by the AID computer process includes Figures 5 - 7 and appear in Appendix A.[9]

The analysis of variance table below (Table 30) indicates an F-ratio of .80 which means that the several explanatory variables used in the analysis (age, level of education, race and sex) are not significant with relation to the interaction between them and the dependent variable (the number of weeks unemployed before training).

TABLE 30.--Analysis of Variance of Average Number of Weeks Unemployed.

Source of Variation	Sum of Squares	DF.	Mean Square	F	Significance Level
Total	1146.74	139			
Between	46.94	7	6.70	.80	non-significant
Within	1099.80	132	8.33		

[9]Please read instructions in Appendix for interpreting AID before attempting to read Figures 5, 6, and/or 7.

TABLE 31.--Mean and Standard Deviation of Specific Variables Used in Analysis of Number of Weeks Unemployed Prior to Training.

Variable	Mean	Standard Deviation	N	Percentage
	$\tilde{(X)}$	(s)		
Age				
0 - 14 20 - 29 30 - 44	1.63	3.03	120	85.70
15 - 19 45 - 59	1.00	1.37	20	14.30
Educational Level				
10 - 11 Grade 13 Grade	1.88	1.36	17	12.10
8 - 9 Grade 12 Grade	1.59	3.22	103	73.60
Age				
0 - 14 30 - 44	1.88	4.68	43	30.70
20 - 29	1.38	1.42	60	42.90
Race				
White and Other	2.09	5.20	34	24.30
Black	1.11	1.37	9	6.40
Sex				
Female	2.28	5.61	29	20.70
Male	1.00	0.00	5	3.60
Race				
Black and Other	1.75	1.40	28	20.00
White	1.06	1.34	32	22.90
Age				
20 - 29	2.67	1.33	9	6.40
30 - 34	1.00	.71	8	5.70

The second test centered around testing the significance of wage in last full-time job held prior to training (dependent variable) against the explanatory variables as analyzed under the first test above, e.g., age, level of education, race and sex. The sample mean and standard deviation were computed and presented in Table 32.

The analysis of variance table on page 95 (Table 33) indicates an F-ratio of 6.6. This means that there is interaction between the several explanatory variables (age, level of education, race and sex) and the dependent variable (average wage in full-time job prior to training.) This interaction is significant at the .05 level. Figure 6 in Appendix A is a diagramatic presentation of the interaction of the explanatory variables (age, level of education, race and sex) and the dependent variables (wage in full-time job prior to training) as determined by AID. The explanatory variables which had the highest interaction occurred in the following order: (1) sex, (2) level of education, (3) age and (4) race.

The third and final analysis of variance dealt with the average monthly wage in full-time job held after training as a dependent variable and the following explanatory variables: age, race, sex, completed training, clock hours, class cost, employment status before training, and welfare status.

The analysis of variance table (Table 35) on page 98 indicates that there is interaction between the dependent variable (wage after training) and the explanatory variables completed training sex, race, age, class clock hours, welfare status, employment status before training

TABLE 32.--Mean and Standard Deviation with Specific Variables used in Analysis of the Average Wage in Full-time Job Prior to Training.

Variable	Mean	Standard Deviation	N	Percentage
	$\tilde{(X)}$	(s)		
Sex				
Male	379.00	179.00	31	22.10
Female	274.00	102.00	109	77.90
Educational Level				
13	387.00	141.00	6	4.30
8-9,10-11,12	268.00	95.60	103	73.60
Age				
30-44,45-59	446.00	120.00	14	10.00
20-29	324.00	199.00	17	12.10
Age				
0-14,30-44	284.00	89.00	37	26.40
15-19,20-29, 45-59	259.00	98.00	66	47.10
Race				
Black	464.00	96.00	5	3.60
White and Other	266.00	202.00	12	8.60
Educational Level				
10-11 Grade	320.00	76.00	5	3.60
12	254.00	98.00	61	43.60
Race				
White	263.00	75.00	37	26.40
Black and Other	239.00	124.00	24	17.10
Race				
Black	312.00	78.00	7	5.00
White and Other	277.00	90.00	30	21.40

TABLE 33.--Analysis of Variance of Average Wage Prior to Training.

Source of Variation	Sum of Squares	DF.	Mean Square	F	Significance Level
Total	2,397.613.00	139			
Between	648,018.00	8	81,002.25	6.06	.05
Within	1,749,595.00	131	13,355.68		

TABLE 34.--Mean and Standard Deviation of Specific Variables Used in Analysis of Monthly Wage in Full-time Job Held After Training.

Variable	Mean	Standard Deviation	N	Percentage
Completed Training				
Yes and No Response	407.00	142.00	132	94.30
No	125.00	180.00	8	5.70
Sex				
Male	483.00	166.00	29	20.70
Female	386.00	126.00	103	73.60
Race				
White	408.00	114.00	71	50.70
Black and Other	336.00	137.00	32	22.90
Class Clock Hours				
0-499,500-999, 1000-1499	387.00	132.00	44	31.40
1500-1999 2000-2499	441.00	65.00	27	19.30
Race				
White	539.00	106.00	18	12.90
Black and Other	392.00	202.00	11	7.90
Age				
20-29	426.00	119.00	18	12.90
30-44,45-59	361.00	134.00	26	18.60
Class Clock Hours				
0-499	151.00	218.00	5	3.60
500-999,1000-1499, 1500-1999,2000-2499	370.00	77.00	27	19.30
Employment Status Before Training				
Underemployed	418.00	90.00	9	6.40
Unemployed and Employed	330.00	143.00	17	12.10
Welfare				
No	354.00	138.00	11	7.90
Yes	287.00	143.00	6	4.30

TABLE 34.--Continued

Variable	Mean	Standard Deviation	N	Percentage
Cost of Class				
$0-1999	503.00	192.00	5	3.60
2000-3999				
4000-5999	396.00	47.00	13	9.30
Cost of Class				
0-1999,2000-3999	580.00	113.00	11	7.90
4000-5999,				
6000-6999	476.00	41.00	7	5.00
Age				
0-14,20-29,				
45-59	380.00	60.00	21	15.00
30-34	335.00	113.00	6	4.30
Cost of Class				
0-1999,2000-3999	431.00	62.00	19	13.60
4000-5999				
6000-6999	465.00	65.00	8	5.70
Employment Status Before Training				
Underemployed	405.00	68.00	5	3.60
Unemployed,				
Employed	372.00	55.00	16	11.40
Cost of Class				
$0-1999	463.00	75.00	7	5.00
2000-3999	413.00	43.00	12	8.60
Class Clock Hours				
500-999				
100-1499	354.00	43.00	11	7.90
1500-1999,				
200-2499	412.00	58.00	5	3.60

TABLE 35.--Analysis of Variance of Average Wages After Training.

Source of Variation	Sum of Squares	DF.	Mean Square	F	Significance Level
Total	3,520,080.00	139			
Between	1,568,240.00	16	98,015.00	6.17	.05
Within	1,951,840.00	123	15,868.61		

and cost of class and that the interaction is significant at the .05 level.

Figure 7 in Appendix A is a diagramatic presentation of the interaction of the explanatory variables (average monthly wage after training as determined by AID). The independent variables which had the highest influence on wage after training occurred in the following order: (1) completion of training, (2) sex, (3) race, (4) class clock hours; (5) employment status before training, (6) age and (7) welfare status: recipient vs. non recipient.

J. Significance of Wage Differential

From earlier computations, it was determined that the average monthly wage before training was $302.36 and that the average monthly wage after training increased to $396.00. Questions implicit in this wage change are (1) is the change statistically significant, and (2) at what level of significance? Moreover, did inflation have a significant effect? These questions are answered later in the chapter.

Table 36 shows a summary of the average before training/after training wage for the 140 individuals in the sample and their respective standard deviation.

TABLE 36.--Average Monthly Wage Before and After Training.

	Before Training	After Training
Sample Size	140	140
Average Earnings	X_1 = $302.36	X_2 = $396.00
Standard Deviation	s_1 = 5.73	s_2 = 42.69

The answers to questions 1 and 2 above presuppose certain hypotheses regarding the significance of the differences between the before and after-training wages, e.g., the Null Hypothesis is that there is no difference between the average wage before and after training:

Null hypothesis H_0: $h_1 = h_2$: $302.36 = 396.00

Alternative hypothesis H_1: $h_1 \neq h_2$: $302.36 $\neq$ 396.00

The standard error of the difference between two sample means is 15.238. The test is defined by:

$$t = \frac{X_1 - X_2}{SE\ (X_1 - X_2)}$$

= 6.15 where X_1 is the average wage before training, X_2 is the average wage after training and SE is the standard error of

the difference. The computed value of t = 6.15 is significant at the 1% level of significance (2.321), indicating that there exists significant difference between the average monthly earnings before and after training.

The impact of inflation was discussed at some length in the earliest part of this chapter, consequently an analysis of real income was undertaken and is presented as real income distribution in Table 37 below:

TABLE 37.--Real Income Distribution.

Income Range	Frequency
Less than 49	4
50 to 99	1
100 to 149	3
150 to 199	3
200 to 249	6
250 to 299	21
300 to 349	21
350 to 399	42
400 to 449	23
450 to 499	4
500 to 549	6
550 to 599	2
600 over	4
	140

Average Real Income after Training = $329.90
Average Real Income before Training = $302.36

(1967=100)

$$t = \frac{329.90-302.36}{12.00}$$

$$= 2.2950$$

$t_{.05}$ (level of significance) = 1.645
$t_{.01}$ (level of significance) = 2.326

∴ The computed t-value is significant at 1% level.

It is interesting to note that the deflated value of the after-training wage does not alter the prior hypothesis regarding the significance of the wage before-and after-training. In fact, the computed t-value of the delfated wage is significant at the 1% level. This is an indication that training made a difference in the after training wage, and that the difference is significant irrespective of inflation during the 1968-72 period.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The objective of this research has been to determine the success in Michigan of the MDTA individual referral system. The criteria for measuring success was determined by the extent to which enrollees increased their incomes and enhanced their employability as a result of enrollment in the program and obtained a training-related job upon graduation.

Analyses undertaken in Chapter IV indicate that the Michigan program was successful. The degree of success will be summarized later in this chapter. However, prior to that, it might be of interest to summarize some of the other results of the study, as follows:

1. Age Structure. Although the age of the sample of trainees ranges from 15-60, the average age of the sample was 32 and the median was 30 years, with the highest percentage falling in the age group 20-24 (see Table 2).

2. Sex. It was interesting to note that females dominated the program with an enrollment of 77 percent. One might have assumed that with MDTA designed primarily to address structural changes in the labor market which was male oriented, that more males would have enrolled in the training programs. The fact that more females than

males enrolled has led this researcher to speculate that (a) during structural changes in the labor market which affect the length of unemployment, there is a greater propensity for women to seek training for future employment. Moreover, that training programs constitute a singular vehicle for enhancing equality of access to employment for females; (b) that this large female training participation rate was generated as a consequence of the market demand for "traditional" female professions, e.g., secretary, licensed practical nursing, etc.

3. Program Enrollment. The overwhelming enrollment was in licensed practical nursing, followed by cosmetology, secretary, medical assistant. Enrollment in the "traditionally" male profession, e.g., truck driving, auto mechanic, mechanical technician, etc., was low (see Table 14).

4. Educational Level. Eighty-two percent of the enrollees had compelted the 12th grade upon enrollment. While the program thrust was directed at this level of educational achievement, the educational level of the enrollees ranged from grades 8-13 (see Table 4).

5. Participation by Race. An interesting observation was the relatively low training participation rate for blacks and other minorities. Table 5 shows that approximately 35 percent blacks and other minorities were enrolled as compared with 65 percent whites. While the research was not designed to determine the reasons for low minority participation rates, one might assume that (a) minorities who had completed the 12th grade saw a brighter future in obtaining a college degree; (b) greater percentages of minorities were probably enrolled

in regular MDTA (institution) programs; (c) minorities had traditionally had limited access to employment opportunities and therefore were not directly affected by structural changes in the labor market.

A further observation relative to racial participation rates is that a greater number of white females age 30 and above enrolled in the program than their black counterparts. This situation appears to reinforce labor force statistics which indicate an increasing number of post child-bearing aged women returning to or entering the labor forces for the first time.

Now, in order to determine the extent to which the training program was successful, this researcher reviewed employment status of the trainees before and after training, assuming that if an enrollee completed the training program and obtained a training-related job, the program was successful. Moreover, a comparison was made of wages immediately prior to and after obtaining employment to determine income differential and the significance of the difference. Also, an analysis of real income of the trainees during the period was undertaken to determine whether inflation had an impact on the after-training wage.

The results are as follows:

1. Analyses of the employment status of the sample prior to training indicate that 54 percent was unemployed, 41 percent under-employed, four percent employed, and one percent undecided (see Table 17a). After the training program, approximately 92 percent of the sample was employed, one percent underemployed, four percent continued umemployed, and three percent undecided (see Table 17b).

2. Following completion of the training, 81 percent of the graduates were employed in training-related jobs (see Table 19).

3. A computation of average and median wages before and after training revealed the following:

a. Average wage before training: $302.36
   Median wage before training: 285.99

b. Average wage after training: 396.00
   Median wage after training: 418.00

A t-test (see Chapter IV) indicated that the wage differential was significant at the one percent level of significance (2.321). Also, a t-test of the value of real incomes for the period, using the Consumer Price Index indicated a significance at the one percent level (see Table 37), meaning that inflation had no significant effect on wages.

4. A series of tests based on analyses of variance were used to determine interaction effect of (a) average monthly wage in full-time job prior to training based on certain variables, e.g., age, race, sex, educational level and (b) average monthly wage in full-time job after training also based on the same set of variables. The analyses of variance was designed also to test the significance of the interaction of the dependent and explanatory variables. The analysis for (a) indicated a strong interaction (.05 level). The interaction was strongest for (1) sex, followed by (2) level of education, (3) age and then (4) race. Analysis for (b) indicated a high interaction (.05 level). The interaction was strongest for (1) completion of training, followed by (2) sex (3) race (4) class clock hours (5) employment status before training (6) age and (7) welfare status.

5. That while the training program was useful in improving employability and the earning capacity of the individual graduate, institutional racial biases in the labor market continued to subject blacks and other minorities to less than parity wage with their white counterparts (see Figure 7). Similarly, market discriminatory practices restricted the earning capacities of qualified females.

Conclusions which may be drawn from this study consist of the following:

1. That cost-effectiveness as cited in the literature review section of this study is a good administrative tool for improving the efficiency of a manpower training program but it should not be used exclusively to determine the allocation of government resources.

2. That the individual referral training program under MDTA was effective in upgrading the vocational skills of the enrollees and in improving their earning potential.

3. That retrospective evaluation of a training program poses serious limitations of the validity of research results due to the difficulty of obtaining relevant data.

4. That analysis with respect to real income indicates that there has been an important effect of the training program in increasing the real purchasing power of the trainees.

5. That the explanatory variable most significant in the determination of the amount of average monthly wage prior to training was sex. Males were more likely than females to receive the highest monthly wage. Level of education, age and race followed sex in significance.

6. That the explanatory variable most significant in the determination of the amount of average monthly wage after training was whether the participant completed training. This variable was followed by sex, race, number of class clock hours, age and welfare status.

Recommendations

1. That greater emphasis be placed by the Michigan Employment Security Commission upon updating its records relative to training programs. Toward this end, enrollees in training programs might be required to cooperate in providing post-training information relative to their employment and earnings as a pre-condition for enrollment in a training program.

2. That the prime sponsorship of manpower programs where only state and local governmental units are the prime sponsors presents a great possibility for the achievement of the legislative objectives, and should be encouraged. However, this researcher believes that state governments should be given a greater coordinative responsibility over local governmental units.

3. That training under the individual referral system should be continued because it provides the opportunity for obtaining a broad mix of vocational and educational competence.

4. That the relatively low male enrollment in the program could be a result of the need by MESC for improvement in communicating the program. Therefore, MESC should undertake a more vigorous role in recruitment into training through a clearer identification of the publics at which the program is directed.

5. That the MESC should establish a more useful record keeping and data control system relative to manpower statistics. An effective system of follow up would have yielded more of the data that was necessary for this study. While for the most part, intake data was available, there was a paucity of information on the trainees after they dropped out or graduated from the program.

Limitation of the Study

The original sample had to be reduced from 25% of the population to 7% of the population, meaning that conclusions are based on a 28% response rate. While for a large population this situation might not be a problem, it may have an affect on a small population such as was used in this study, and may therefore tend to place limitations on the findings.

APPENDICES

APPENDIX A

INSTRUCTIONS FOR READING AID

APPENDIX A

Instructions for Reading AID Graphical Presentations in Figures 5, 6, and 7 as Derived from Computer Print-Out

1. The numbers on the left, outside corner of the squares are group numbers, e.g., group 1, group 2, etc.

2. The meaning of the notations inside and between the squares may be determined from the legend.

3. The entries are read from the top down starting with the group in which the reader may have an interest. Example, using Figure 5.

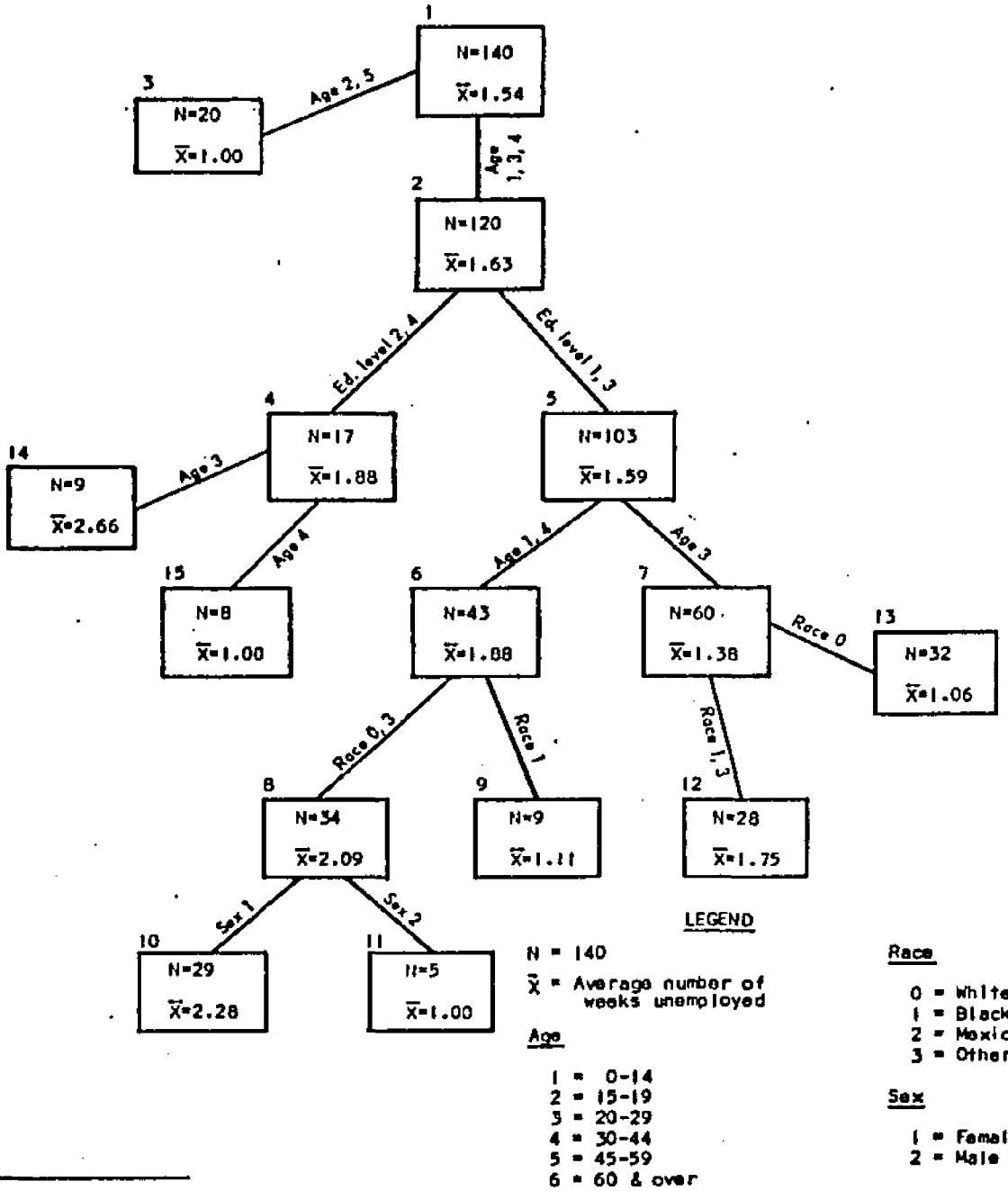
1. Group 1 represents the total sample population in which N = 140 and X - 1.54 represents the average number of weeks unemployed before training.

2. Groups 2 and 3 are derived from group 1 and are differentiated on the basis of age, e.g., group 3 contained age groups 2 and 5 and group 2 contained age groups 1, 3, 4.

3. Successive groups continue to be derived on the basis of significance of variables inside and between the groups.

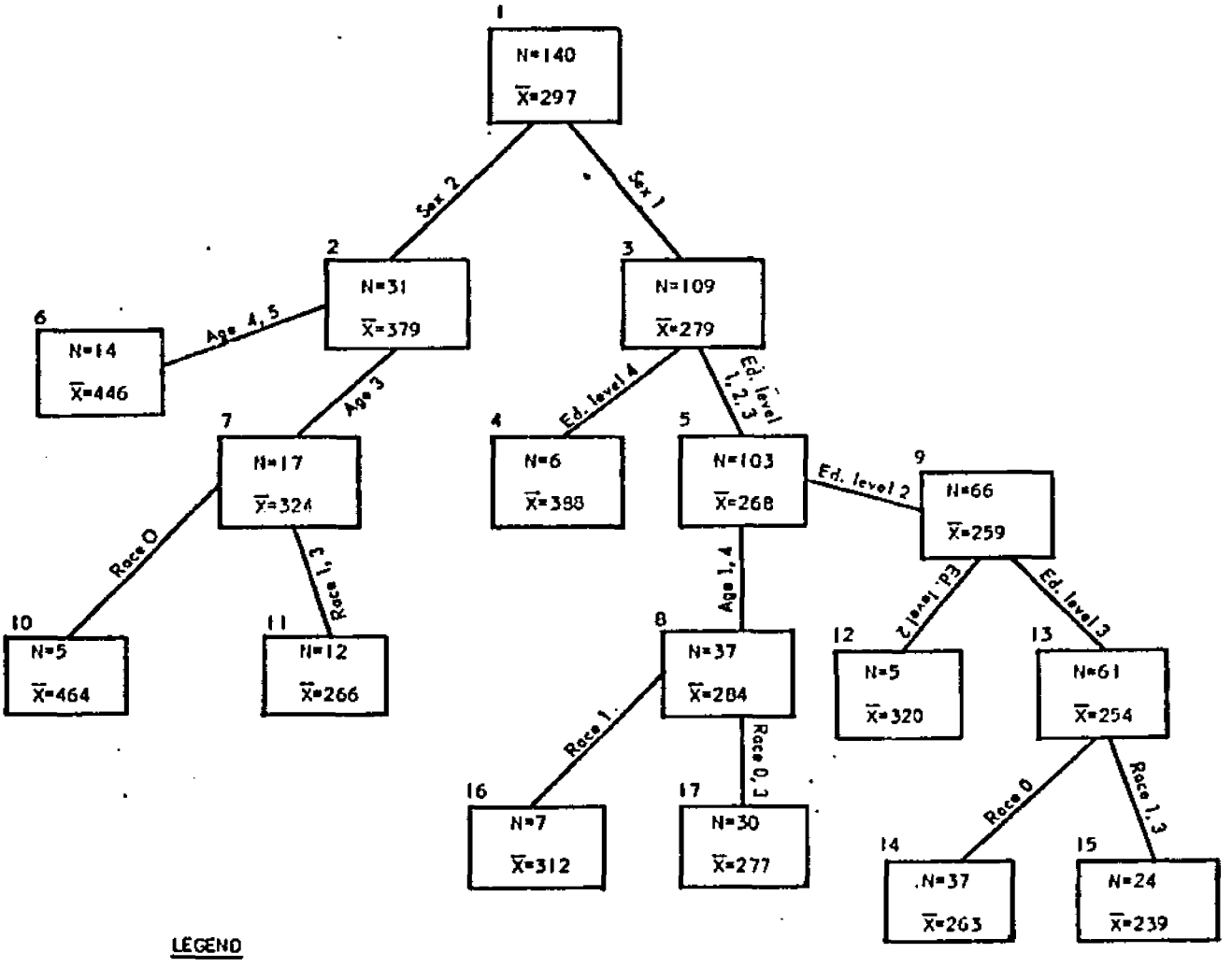
Therefore, if the reader is interested in the high (X 2.28) number of weeks of unemployment as represented in group 10, it may be read as follows: females, white or other, in age group (1,4) 0-14 and 30-44 with educational levels 8-9 and/or 12th grades.

Conclusion: White females representing these characteristics were unemployed the longest. On the contrary, males with similar characteristics (group 11) were unemployed for a shorter duration, e.g., one week.



*See computer print-out Appendix B for derivation of Figure 5. Figures 6 and 7 are similarly derived.

Figure 5.--Average Number of Weeks Unemployed Before Training.



LEGEND

N = 140

X̄ = Average number of weeks unemployed

Age

1 = 0-14
2 = 15-19
3 = 20-29
4 = 30-44
5 = 45-59
6 = 60 & over

Race

0 = White
1 = Black
2 = Mexican American
3 = Other

Sex

1 = Female
2 = Male

Educational Level

1 = 8-9th grade
2 = 10-11 "
3 = 12 "
4 = 13 "

Figure 6.--Average Wage in Full-time Job Held.

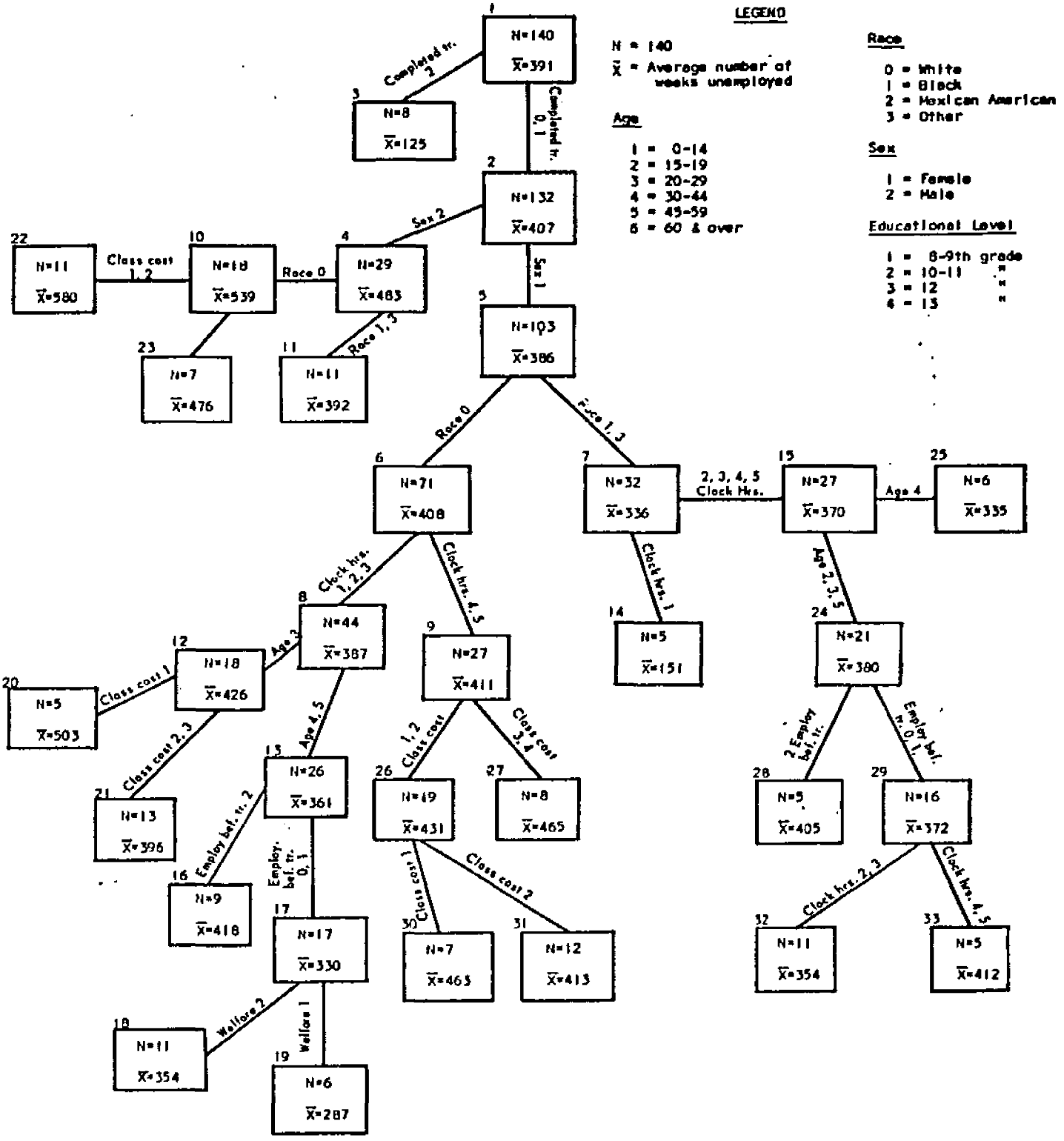


Figure 7.--Average Monthly Wage After Training.

APPENDIX B

MA-101

U. S. DEPARTMENT OF LABOR
MANPOWER ADMINISTRATION
Form MA-101 (6-68)

APPLICANT INFORMATION RECORD

FORM APPROVED
BUDGET BUREAU NO. 44-R1202.2

1. CONTRACT IDENTIFICATION
a. State of Training
b. State Code | c. Fiscal year approved
d. Contract No. (Prefix) (Prime) (Sub)

2. FUNDING CODE
a: A__CEP; B__Model City; C__CWTP; __Other (Specify)
b: A__MDTA; B__EOA; C__Social Security; __Other (Specify)

3. PROGRAM IDENTIFICATION
01__MDTA-Institutional; 03__MDTA-OJT; 05__MDTA-Coupled; 07__MDTA-Part-time; 11__NYC-In school; 13__NYC-Out of school; 15__NYC-Summer; 21__New Careers; 23__Operation Mainstream; 25__Orientation; 27__Special Impact; __Other (Specify)

4. MDTA INSTITUTIONAL SEC. NO.

5. WIN ONLY 1__ES 2__CAA 3__Other

6. LOCAL ES OFFICE NO.

7a. NAME OF CONTRACTOR

7b. ADDRESS (Number, Street, City, State, and Zip Code)

8a. OCCUPATIONAL GOAL (Name)

8b. DOT (9 digit)

9a. TARGET AREA (Name)

9b. CODE

10. START DATE (Mo. day, yr)

11a. NAME OF APPLICANT (Last, first middle initial)

11b. PHONE NO.

11c. SOCIAL SECURITY NO.

12. ADDRESS (Number, Street, City, State, and Zip Code)

13. COUNTY OF RESIDENCE a. Name | b. Code

14. CONGRESSIONAL DIST. a. State Code | b. District No.

15. DATE OF BIRTH (Mo. & yr)

16. SEX 1__Male; 2__Female

17. HANDICAPPED 1__Yes; 2__No

18. MILITARY SERVICE STATUS 1__Veteran; 2__Rejectee; 3__Other non-vet
Discharge Date (Month, day, & year)

19. MARITAL STATUS 1__Never married; 2__Married; 3__Widow / Widower; 4__Divorced / legally separated

20. PRIMARY WAGE EARNER 1__Yes; 2__No

21. HEAD OF FAMILY OR HEAD OF HOUSEHOLD 1__Yes; 2__No

22. NO. OF DEPENDENTS 0__; 1__; 2__; 3__; 4__; 5__; 6 and __ over

23. CHECK ONE 1__White; 2__Negro; 3__Amer. Indian; 4__Oriental; 5__Other

24. IF SPANISH SURNAME, CHECK ONE 1__Mexican American; 2__Puerto Rican; 3__Other

25. U. I. CLAIMANT 1__Yes; 2__No; 3__Exhaustee

26. PUBLIC ASSIST. RECIPIENT 1__Yes 2__No
If YES, fill out reverse side.

27. HIGHEST SCHOOL GRADE COMPLETED

28. PREVIOUS JOB TRAINING 1__Yes (If YES, complete the information below) 2__No
a. Job Title
b. DOT (6-digit) | c. Date completed (Mo & yr)

29. PARTICIPATION IN OTHER FEDERAL PROGRAMS 9__None
Participated in (check all relevant items)
a1__MDTA; 2__NYC; 4__Project Transition
b1__Operation Mainstream; 2__Special Impact; 4__Work Incentive
c1__Job Corps I; 2__Job Corps II; 4__Job Corps III
d1__New Careers; 2__Other

30a. PRIMARY OCCUPATION TITLE (if any)

30b. DOT (9 digit)

31a. OCCUPATION TITLE OF LAST FULL-TIME CIVILIAN JOB

31b. DOT (6 digit)

32. YEARS OF GAINFUL EMPLOYMENT 1__Under 1 year; 2__1-2 years; 3__3-9 years; 4__10 years and over

33. ESTIMATED AVERAGE HOURLY EARNINGS ON LAST FULL-TIME CIVILIAN JOB $__

34. INCOME
a. Applicant's estimated earnings last 12 months $__
b. Estimated family income last 12 months $__
c. Number in family __
d. Family below poverty level 1__Yes 2__No

35. LABOR FORCE STATUS AT TIME INTERVIEWED (Check only one)
11__Employed (not underemployed)
12__Underemployed
13__Unemployed
14__Family farm worker
21__Not in labor force - in school
22__Not in labor force - other

36. WEEKS UNEMPLOYED
__Last 12 Mos. (all applicants)
__Current spell (Unemployed only)

37. REFERRED BY
01__E. S. Outreach; 02__NYC; 03__Job Corps; 04__Union; 05__Employer; 06__Self; 07__Welfare; 08__Other community group; 11__Coop School Graduate; 12__Coop School Dropout; 21__Sel. Service Rehab. (Recruiting Station); 22__Sel. Service Rehab. (AFEES); 23__Sel. Service Rehab. (Local Board); 31__Other

38. DISADVANTAGED 1__Yes; 2__No

39. REFERRAL TO TRAINING OR EMPLOYMENT

a. Accepted referral to training or job	b. Enrolled in training	c. Placed in job
1__Yes	1__Yes	1__Yes
2__No	2__No	2__No

40. ELIGIBILITY FOR TRAINING ALLOWANCE 9__Not eligible
Eligible for: 1__Regular; 2__Augmented; 3__Youth; 4__Special NYC; 5__Intensive; 6__Part-time

41. CHECK APPROPRIATE ITEM(S) IF ELIGIBLE FOR OTHER ALLOW.
1__Subsistence; 2__Transportation; 3__Other

42. BARRIERS TO EMPLOYMENT 9__None
a1__Age - too young; 2__Age - too old; 4__Lacks education, training skill, experience, or has obsolete skill
b1__Health problem; 2__Personal problem; 4__Transportation problem
c1__Child care problem; 2__Care of other family member; 4__Conviction record
d1__Garnishment; 2__Other

43. DATE OF INTERVIEW (Month, day, & year)

Form MA-101 (8-68)

APPLICANT INFORMATION RECORD SUPPLEMENT

PART A - ALL PUBLIC ASSISTANCE RECIPIENTS

1. FINANCIAL AID RECEIVED

1__APID 5__General Assistance
2__AFDC 6__AFDC and General Assistance
3__OAA 9__Other
4__AABD

2. RESIDES IN PUBLIC HOUSING 1__Yes 2__No

3. PARTICIPATED IN CWT AND /OR TITLE V

1__CWT 3__Both CWT and Title V
2__Title V 4__Neither

4. NUMBER OF DEPENDENTS BY AGE AND ARRANGEMENT MADE FOR THEIR CARE

	1. Under 6 yrs.	2. 6-15 yrs.	3. 16-21 yrs.	4. 22-64 yrs.	5. 65 yrs. & over
a. Number of dependents					
b. Number for whom care is needed					

5. FOR YOUTH ONLY —APPLICANT LIVES WITH

1__Both parents 3__Mother 5__Other
2__Father 4__Guardian

PART B - WIN APPLICANTS ONLY

6. REFERRAL CATEGORY

7. AMOUNT OF WELFARE CASH ASSISTANCE TO FAMILY FOR MONTH PRIOR TO REFERRAL $_____

8. OTHER FAMILY MEMBER ALREADY IN WIN 1__Yes 2__No

9. SEASONAL AGRICULTURAL WORKER APPROVED FOR AFDC IN LAST 5 YEARS 1__Yes 2__No

10. LENGTH OF TIME ON AFDC

	Years	Months
a. Total time during last five years		
b. Consecutive time since most recent approval of AFDC		

11. COMMENTS

SIGNATURE OF INTERVIEWER

TITLE | DATE

PART C - SERVICES PROVIDED

1. EMPLOYABILITY PLAN INVOLVES *(Check one or more kinds of assistance needed)*

__a. Counseling
__b. Orientation
__c. Training
__d. Relocation

Supportive Services:
__e. Health
__f. Rehabilitation
__g. Welfare
__h. Other

2. FAMILY INCOME GROUP __a. Farm __b. Nonfarm

3. PARTICIPANT OF PROJECT 100,000 *(As specified on Form YES I)* __a. Yes __b. No

4. SERVICES PROVIDED

TYPE OF SERVICE			DATE
a. COUNSELING INTERVIEWS			
b. COUNSELING SESSIONS			
c. GUIDANCE SESSIONS			
d. JOB DEVELOPMENT CONTACT			
e. PLACEMENT IN JOB 3 DAYS OR LESS			
f. PLACEMENT IN REGULAR JOB	DOT CODE (6-digit)	SIC (2-digit)	
g. APPLICANT-EMPLOYER INTERVIEW			
h. SPECIAL PLACEMENT			
i. REFERRED TO SUPPORTIVE SERVICE	(1) HEALTH		
	(2) REHABILITATION		
	(3) WELFARE		
	(4) OTHER		
j. FOLLOWUP CONTACT			
k. OTHER *(specify)*			

5. TRAINING REFERRALS AND ENROLLMENTS

TYPE OF TRAINING	DATE REFERRED	DATE ENROLLED
a. MDTA - INSTITUTIONAL		
b. NYC		
c. NYC - MDTA CONCURRENT		
d. JOB CORPS		
e. OPERATION MAINSTREAM		
f. NEW CAREERS		
g. SPECIAL IMPACT		
h. RETURN TO SCHOOL		
i. OTHER		

APPENDIX C

MA-102

D/L-D/TLW
Form MA-102 (8-69)

INDIVIDUAL TERMINATION/TRANSFER REPORT

Form Approved
Budget Bureau No. 44-R1204

1. NAME OF TRAINING FACILITY/CONTRACTOR | 2. ADDRESS (Number, Street, City, State, and Zip Code)

3. Soc. Sec. No. | 4. NAME OF TRAINEE | 5. ADDRESS (Number, Street, City, State, and Zip Code)

6. CONTRACT (PROJECT) IDENTIFICATION
a. Name of State
b. State Code | c. Fiscal year approved
d. Contract No. (Prefix) (Prime) (Sub) | e. Soc. Sec. No.

7. PROGRAM IDENTIFICATION

01		MDTA-Inst	21		New Careers
03		MDTA-OJT	23		Operation Main.
05		MDTA-Coupled	41		Other (Specify)
07		MDTA Part-time			
11		NYC In School			
13		NYC Out/School			
15		NYC Summer			

8. ATTENDANCE (Mo., day, yr.): a. First day | b. Last day
9. NO. OF CLASS DAYS: a. Attended | b. Missed
10. CLOCK HOURS ATTENDED
11. LAST SERVICE OR TRAINING COVERED BY THIS REPORT
12. WORK ASSIGNMENT (Omit for MDTA)
[ ] Assignment
[ ] Location

13. TRAINING PHASE (For all relevant training)

			Clock Hrs.
01		Occupational	
02		Basic Education	
04		Pre-Vocational	
08		Emp. Skill/Orientation	
11		Other (Specify)	

14. SERVICES RENDERED (Omit for MDTA)

0		None
1		Counseling _____ No. of Clock Hrs.
2		Testing _____ No. of Clock Hrs.
01		Medical Examination
02		Medical Service
04		Dental Examination
08		Dental Service

15. NATURE OF TERMINATION

COMPLETED TRAINING OBJECTIVE	1		Full Course
	2		Early Completion
	3		Accepted full-time job
DID NOT ACHIEVE TRAINING OBJECTIVE	4		Involuntarily dropped
	5		Voluntarily dropped
	6		Transferred to other MDTA training

16. REASON DROPPED (If voluntarily or involuntarily dropped, check the ONE most important reason below.)

01		Moved from area	05		Pregnancy of trainee	09		Lack of progress or interest	13		Quit school (Omit for MDTA)
02		Returned to school	06		Alcoholism, drugs	10		Poor attendance	14		Agreement terminated (Omit for MDTA)
03		Entered Armed Forces	07		Care of family	11		Misconduct	15		Unknown
04		Illness of Trainee	08		Died	12		Became ineligible (Omit for MDTA)	16		Other (Specify)

17. STATUS AT TIME OF TERMINATION (Complete A or B for all trainees)

A. Working or Scheduled to Report to:			B. Not Scheduled to Report to a Job, But:			C. Primary Workstation (Omit for MDTA)		
1		Training related job	3		Looking for work	5		Scheduled for reporting	(1) Is trainee at previous workstation?	(2) Employer is:
2		Non-training related job	4		Not looking for work	6		Not known	1 Yes	1 Public
									2 No	2 Private, nonprofit
										3 Private, for profit

EMPLOYER'S NAME AND ADDRESS

18. CERTIFICATION BY TRAINING FACILITY (FOR MDTA Trainees only)
This is to certify that the circumstances of termination for the trainee to whom this report refers are:
[ ] 1 For Good Cause [ ] 2 Not for Good Cause (Complete item 19)

a. FACILITY NAME AND ADDRESS
b. NAME AND TITLE OF AUTHORIZED OFFICIAL
c. SIGNATURE | d. DATE

19. REVIEW BY FACILITY OR DEPARTMENT HEAD (Complete for MDTA trainee if termination was Not for good cause; all other programs for each trainee.)
I have reviewed the circumstances surrounding the termination of the Trainee to which this report refers and have found them to be accurately described.

a. AGENCY NAME AND ADDRESS
b. NAME AND TITLE OF AUTHORIZED OFFICIAL
c. SIGNATURE | d. DATE

FOR USE BY SELECTION/REFERRAL OFFICE OR SPONSOR

20. ARE ALL PHASES OF TRAINING OR SERVICES TERMINATED IN THIS PROGRAM?
[ ] 1 YES (If "Yes," enter 9-digit DOT Code for occupation listed in item 11) | DOT CODE
[ ] 2 NO

COMPLETE BELOW IF ANY ADDITIONAL OR CONTINUING ACTIVITY IS SCHEDULED

21. PROGRAM IDENTIFICATION (Enter code from item 7 above or check applicable program)

	Program Identification Code				
23		Special Impact	37		Upward Bound
25		Job Corps	43		Other (Specify)
41		CEP			
42		WIN			
45		OIC			

Complete for MDTA Programs only

22. MDTA CONTRACT (PROJECT) IDENTIFICATION
a. State Name | b. State Code | c. FY Approved | c. Contract No. Prefix Prime Sub | d. Soc. Sec. No.

23. OCCUPATION | 24. DOT CODE

25. IS TRAINEE ENROLLED IN ADDITIONAL ACTIVITY?
[ ] 1 Yes
[ ] 2 No (If "No," enter reason code from item 16 above) | 26. REASON CODE

STATE NAME AND CODE | OFFICE OR AGREEMENT NUMBER | DATE

APPENDIX D

MA-103

AS AN MDTA TRAINEE, YOU ARE ASKED TO FURNISH INFORMATION 3 MONTHS AND 6 MONTHS AFTER COMPLETION OF YOUR TRAINING TO MEASURE THE RESULTS OF THE MDTA PROGRAM. READ THE INSTRUCTIONS BELOW, COMPLETE THE QUESTIONS AND MAIL THIS QUESTIONNAIRE TO YOUR EMPLOYMENT SERVICE OFFICE IN THE ENCLOSED SELF-ADDRESSED ENVELOPE.

NO POSTAGE IS REQUIRED

DO NOT TEAR OR CUT THIS CARD

(Fold on this line)

Participants of Department of Labor Training and those who received special services leading to employment: Please complete the designated items below, refold, and mail. If your name and address is different from that shown, please correct and return the envelope folded.

Check only ONE of boxes 1, 2, 3, 4, or 5 under "A" below. If you check box 1 or 2, answer all questions to the right of the box checked.

Telephone No. *(Where you can be reached)*

A. During last week were you:

☐ 1. EMPLOYED *(Answer questions B to F only)* →

B. How many hours did you work last week?

0 ☐ None 1 ☐ Less than 15 2 ☐ 15 to 34 3 ☐ 35 to 40 4 ☐ More than 40

C. Date last worked *(Mo., day, year)*

D. How many weeks have you held this job since completing training? _____ weeks

E. How much did you earn an hour? *(Do not include overtime)* $ _____ . _____

F. What do you do on your job? *(Include actual job title if known)*

☐ 2. NOT WORKING AND NOT LOOKING FOR A JOB *(Answer question G only)* →

G. What was the reason you were not working or looking for work? *(Check ONE box which best suits your reason.)*

☐ 1. Taking care of family ☐ 2. In school or training ☐ 3. Received order to report for Military duty ☐ 4. Sick

☐ 5. Permanently disabled ☐ 6. Other *(specify)* _____

If you check box 3, 4 or 5 below, return this form without answering any other questions.

☐ 3. IN THE ARMED FORCES

☐ 4. LOOKING FOR A JOB

☐ 5. WAITING TO REPORT TO A JOB IN THE NEXT 30 DAYS

DO NOT WRITE IN THIS SPACE — FOR OFFICE USE ONLY

Social Security Number ☐☐☐ ☐☐ ☐☐☐☐

State Code ☐☐ Fiscal Year ☐☐

Contract/Project Number Prefix ☐☐ Prime ☐☐☐☐ Sub ☐☐☐☐ Section ☐☐

DOT Code ☐☐☐ ☐☐☐ ☐☐☐

Report Number 1 ☐ 2 ☐ 4 ☐ 5 ☐

Source 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐

U.S. DEPARTMENT OF LABOR
MANPOWER ADMINISTRATION
Form MA-103 (8-69) (1-70)

CURRENT JOB STATUS REPORT

Form Approved
Budget Bureau No. 44-R1246

APPENDIX E

COMPUTER PRINT-OUT FOR FIGURES 5, 6, 7

* (A)UTOMATIC (I)NTERACTION (D)ETECTOR (MODEL 2) *

UNEMP (UKs) Before

* * * S U M M A R Y * * *

DEPENDENT VARIABLE 5 ([illegible])

WEIGHTED BY VARIABLE 0

** TOTAL GROUP

N = 140	MEAN = 0.154285625 01	SUM Y = 0.21400000E 03	TSS = 0.11467432E 04	
TOTAL WT SUM = 140.	STD. DEV. = 0.236199575 01	SUM Y SQ. = 0.14500000E 04		

* GROUP NO. 2 SPLIT FROM GROUP 1 ON VARIABLE 1 (AGE)
VALUES OF PREDICTOR INCLUDED ARE 1 3 4

N = 120	MEAN = 0.158333325 01	GROUP DEVIATION = 0.904759895-01	SUM Y = 0.19000000E 03	
WEIGHT SUM = 120.	STD. DEV. = 0.323321815 01	TSS(I) = 0.11019667E 04	SUM Y SQ. = 0.14220000E 04	
PCT OF TOTAL = 85.7	STD. MEAN SQ. = 0.320133205 03	(TSS(I)/TSS(T)) = 0.96080615E 00		

* GROUP NO. 3 SPLIT FROM GROUP 1 ON VARIABLE 1 (AGE)
VALUES OF PREDICTOR INCLUDED ARE 2 5
*** THIS GROUP IS RETAINED AS ONE OF FINALS.

N = 20	MEAN = 0.100000005 01	GROUP DEVIATION = -0.54295622E 00	SUM Y = 0.20000000E 02	
WEIGHT SUM = 20.	STD. DEV. = 0.137840465 01	TSS(I) = 0.38000000E 02	SUM Y SQ. = 0.58000000E 02	
PCT OF TOTAL = 14.3	STD. MEAN SQ. = 0.200000005 02	(TSS(I)/TSS(T)) = 0.33137321E-01		

* GROUP NO. 4 SPLIT FROM GROUP 2 ON VARIABLE 3 (EDUC LEVEL)
VALUES OF PREDICTOR INCLUDED ARE 2 4

N = 17	MEAN = 0.188235285 01	GROUP DEVIATION = 0.339496615 00	SUM Y = 0.32000000E 02	
WEIGHT SUM = 17.	STD. DEV. = 0.136693495 01	TSS(I) = 0.31764709E 02	SUM Y SQ. = 0.92000000E 02	
PCT OF TOTAL = 12.1	STD. MEAN SQ. = 0.602352905 02	(TSS(I)/TSS(T)) = 0.27697932E-01		

* GROUP NO. 5 SPLIT FROM GROUP 2 ON VARIABLE 3 (EDUC LEVEL)
VALUES OF PREDICTOR INCLUDED ARE 1 3

N = 103	MEAN = 0.159223275 01	GROUP DEVIATION = 0.499476485-01	SUM Y = 0.16400000E 03	
WEIGHT SUM = 103.	STD. DEV. = 0.322139935 01	TSS(I) = 0.10683740E 04	SUM Y SQ. = 0.13300000E 04	
PCT OF TOTAL = 73.6	STD. MEAN SQ. = 0.256112975 03	(TSS(I)/TSS(T)) = 0.93209535E 00		

Start

* GROUP NO. 6 SPLIT FROM GROUP 5 ON VARIABLE 1 (AGE)
VALUES OF PREDICTOR INCLUDED ARE 1 4

N = 43	MEAN = 0.186372045 01	GROUP DEVIATION = 0.340864185 00	SUM Y = 0.81000000E 02	
WEIGHT SUM = 43.	STD. DEV. = 0.458152715 01	TSS(I) = 0.94241845E 03	SUM Y SQ. = 0.10950000E 04	
PCT OF TOTAL = 30.7	STD. MEAN SQ. = 0.152561345 03	(TSS(I)/TSS(T)) = 0.82182169E 00		

* GROUP NO. 7 SPLIT FROM GROUP 5 ON VARIABLE 1 (AGE)
VALUES OF PREDICTOR INCLUDED ARE 3

N = 60	MEAN = 0.135333325 01	GROUP DEVIATION = -0.159523015 00	SUM Y = 0.83000000E 02	
WEIGHT SUM = 60.	STD. DEV. = 0.141529275 01	TSS(I) = 0.12018335E 03	SUM Y SQ. = 0.23500000E 03	
PCT OF TOTAL = 42.9	STD. MEAN SQ. = 0.114816655 03	(TSS(I)/TSS(T)) = 0.10480404E 00		

* GROUP NO. 8 SPLIT FROM GROUP 6 ON VARIABLE 4 (RACE)
VALUES OF PREDICTOR INCLUDED ARE 0 3

N = 34	MEAN = 0.205882355 01	GROUP DEVIATION = 0.544378685 00	SUM Y = 0.71000000E 02	
WEIGHT SUM = 34.	STD. DEV. = 0.517823075 01	TSS(I) = 0.91473510E 03	SUM Y SQ. = 0.10670000E 04	
PCT OF TOTAL = 24.3	STD. MEAN SQ. = 0.146264665 03	(TSS(I)/TSS(T)) = 0.82116898E 00		

```
*   GROUP NO.  9  SPLIT  FROM  GROUP  6  ON  VARIABLE     4 (RACE            )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    1
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =          9              MEAN = 0.11111107E 01        GROUP DEVIATION =-0.43174553E 00        SUM Y = 0.10000000E 02
 WEIGHT SUM =       9.         STD. DEV. = 0.13698692E 01                   TSS(I) = 0.15489385E 02    SUM Y SQ. = 0.28000000E 02
PCT OF TOTAL =     6.4       WTD. MEAN SQ. = 0.11111107E 02        (TSS(I)/TSS(T)) = 0.14727693E-01

*   GROUP NO. 10  SPLIT  FROM  GROUP  8  ON  VARIABLE     2 (SEX             )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    1
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =         29              MEAN = 0.22758617E 01        GROUP DEVIATION = 0.73300552E 00        SUM Y = 0.66000000E 02
 WEIGHT SUM =      29.         STD. DEV. = 0.55072388E 01                   TSS(I) = 0.91179296E 03    SUM Y SQ. = 0.10620000E 04
PCT OF TOTAL =    20.7       WTD. MEAN SQ. = 0.15020686E 03        (TSS(I)/TSS(T)) = 0.79511523E 00

*   GROUP NO. 11  SPLIT  FROM  GROUP  8  ON  VARIABLE     2 (SEX             )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    2
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =          5              MEAN = 0.10000000E 01        GROUP DEVIATION =-0.54285622E 00        SUM Y = 0.50000000E 01
 WEIGHT SUM =       5.         STD. DEV. = 0.00000000E 00                   TSS(I) = 0.00000000E 00    SUM Y SQ. = 0.50000000E 01
PCT OF TOTAL =     3.6       WTD. MEAN SQ. = 0.50000000E 01        (TSS(I)/TSS(T)) = 0.00000000E 00

*   GROUP NO. 12  SPLIT  FROM  GROUP  7  ON  VARIABLE     4 (RACE            )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    1    3
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =         28              MEAN = 0.17500000E 01        GROUP DEVIATION = 0.20714378E 00        SUM Y = 0.49000000E 02
 WEIGHT SUM =      28.         STD. DEV. = 0.14047108E 01                   TSS(I) = 0.53750000E 02    SUM Y SQ. = 0.14100000E 03
PCT OF TOTAL =    20.0       WTD. MEAN SQ. = 0.85750000E 02        (TSS(I)/TSS(T)) = 0.48179924E-01

*   GROUP NO. 13  SPLIT  FROM  GROUP  7  ON  VARIABLE     4 (RACE            )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    2
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =         32              MEAN = 0.10625000E 01        GROUP DEVIATION =-0.48035622E 00        SUM Y = 0.34000000E 02
 WEIGHT SUM =      32.         STD. DEV. = 0.13448391E 01                   TSS(I) = 0.57875000E 02    SUM Y SQ. = 0.94000000E 02
PCT OF TOTAL =    22.9       WTD. MEAN SQ. = 0.36125000E 02        (TSS(I)/TSS(T)) = 0.50469015E-01

*   GROUP NO. 14  SPLIT  FROM  GROUP  4  ON  VARIABLE     1 (AGE             )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    3
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =          9              MEAN = 0.26666660E 01        GROUP DEVIATION = 0.11238098E 01        SUM Y = 0.24000000E 02
 WEIGHT SUM =       9.         STD. DEV. = 0.13333330E 01                   TSS(I) = 0.16000015E 02    SUM Y SQ. = 0.80000000E 02
PCT OF TOTAL =     6.4       WTD. MEAN SQ. = 0.63999984E 02        (TSS(I)/TSS(T)) = 0.13952568E-01

*   GROUP NO. 15  SPLIT  FROM  GROUP  4  ON  VARIABLE     1 (AGE             )
    VALUES  OF  PREDICTOR  INCLUDED  ARE    4
*** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
      N  =          8              MEAN = 0.10000000E 01        GROUP DEVIATION =-0.54285622E 00        SUM Y = 0.80000000E 01
 WEIGHT SUM =       8.         STD. DEV. = 0.70710677E 00                   TSS(I) = 0.40000000E 01    SUM Y SQ. = 0.12000000E 02
PCT OF TOTAL =     5.7       WTD. MEAN SQ. = 0.80000000E 01        (TSS(I)/TSS(T)) = 0.34881392E-02

                          * * *   ANALYSIS  OF  VARIANCE  TABLE  * * *

      SOURCE OF           SUM  OF           DEGREE OF          MEAN
      VARIATION           SQUARES            FREEDOM           SQUARE            F

      TOTAL            0.11467437E 04          139.
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BETWEEN         0.46935791E 02          7.        0.67051125E 01      0.80475434E 00
WITHIN          0.10992C74E 04        132.        0.83318739E 01

RESIDUALS  ARE  NOT  REQUESTED.

* * *  E  N  D  * * *
TIME IS NOW 11-15-44(HH.MM.SS.)

LAST GROUP OF DATA HAS BEEN READ AND PROCESSED
AID IS TERMINATED

**FORTRAN RW STOP

// EXEC AX7100,25,180,4000
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                    * (A)UTOMATIC (I)NTERACTION (D)ETECTOR   (MODEL  2) *

                                * * * S U M M A R Y * * *

   DEPENDENT VARIABLE   5  ( AVG BEF TRNG)

   WEIGHTED  BY  VARIABLE    0

** TOTAL GROUP

          N  =        140          MEAN = 0.29744995E 03          SUM Y = 0.41643000E 05          TSS = 0.23976130E 07
 TOTAL WT SUM=        140.     STD. DEV. = 0.13086559E 03     SUM Y SQ. = 0.14754321E 08

*  GROUP NO.   2  SPLIT FROM GROUP   1  ON  VARIABLE    2 (SEX          )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     2
          N  =         31          MEAN = 0.37909667E 03     GROUP DEVIATION = 0.81646728E 02      SUM Y = 0.11752000E 05
  WEIGHT SUM =         31.     STD. DEV. = 0.17872649E 03              TSS(I) = 0.99023800E 06   SUM Y SQ. = 0.54453820E 07
 PCT OF TOTAL =      22.1   WTD. MEAN SQ. = 0.44551440E 07     (TSS(I)/TSS(T)) = 0.41300988E 00

*  GROUP NO.   3  SPLIT FROM GROUP   1  ON  VARIABLE    2 (SEX          )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     1
          N  =        109          MEAN = 0.27422924E 03     GROUP DEVIATION =-0.23220703E 02      SUM Y = 0.29891000E 05
  WEIGHT SUM =        109.     STD. DEV. = 0.10235542E 03              TSS(I) = 0.11419530E 07   SUM Y SQ. = 0.93389390E 07
 PCT OF TOTAL =      77.9   WTD. MEAN SQ. = 0.81969860E 07     (TSS(I)/TSS(T)) = 0.47628742E 00

*  GROUP NO.   4  SPLIT FROM GROUP   3  ON  VARIABLE    3 (EDUC LEVEL   )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     4
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
          N  =          6          MEAN = 0.38683325E 03     GROUP DEVIATION = 0.89383300E 02      SUM Y = 0.23210000E 04
  WEIGHT SUM =          6.     STD. DEV. = 0.14141962E 03              TSS(I) = 0.11999706E 06   SUM Y SQ. = 0.10178370E 07
 PCT OF TOTAL =       4.3   WTD. MEAN SQ. = 0.59763794E 06     (TSS(I)/TSS(T)) = 0.50048552E-01

*  GROUP NO.   5  SPLIT FROM GROUP   3  ON  VARIABLE    3 (EDUC LEVEL   )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     1    2    3
          N  =        103          MEAN = 0.26766967E 03     GROUP DEVIATION =-0.29780273E 02      SUM Y = 0.27570000E 05
  WEIGHT SUM =        103.     STD. DEV. = 0.95604812E 02              TSS(I) = 0.94144900E 06   SUM Y SQ. = 0.83211020E 07
 PCT OF TOTAL =      73.6   WTD. MEAN SQ. = 0.73796530E 07     (TSS(I)/TSS(T)) = 0.39266092E 00

*  GROUP NO.   6  SPLIT FROM GROUP   2  ON  VARIABLE    1 (AGE          )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     4    5
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
          N  =         14          MEAN = 0.44564282E 03     GROUP DEVIATION = 0.14819287E 03      SUM Y = 0.62390000E 04
  WEIGHT SUM =         14.     STD. DEV. = 0.12013979E 03              TSS(I) = 0.20207000E 06   SUM Y SQ. = 0.29824350E 07
 PCT OF TOTAL =      10.0   WTD. MEAN SQ. = 0.27803650E 07     (TSS(I)/TSS(T)) = 0.84279656E-01

*  GROUP NO.   7  SPLIT FROM GROUP   2  ON  VARIABLE    1 (AGE          )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     3
          N  =         17          MEAN = 0.32429394E 03     GROUP DEVIATION = 0.26843994E 02      SUM Y = 0.55130000E 04
  WEIGHT SUM =         17.     STD. DEV. = 0.19928032E 03              TSS(I) = 0.67511500E 06   SUM Y SQ. = 0.24629470E 07
 PCT OF TOTAL =      12.1   WTD. MEAN SQ. = 0.17873320E 07     (TSS(I)/TSS(T)) = 0.28157794E 00

*  GROUP NO.   8  SPLIT FROM GROUP   5  ON  VARIABLE    1 (AGE          )
   VALUES  OF  PREDICTOR  INCLUDED  ARE     1    4
          N  =         37          MEAN = 0.28375659E 03     GROUP DEVIATION =-0.13693359E 02      SUM Y = 0.10499000E 05
  WEIGHT SUM =         37.     STD. DEV. = 0.39304351E 02              TSS(I) = 0.29508500E 06   SUM Y SQ. = 0.32742450E 07
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                                   ... [illegible] E 07        (TSS(I)/TSS(T)) = 0.1[illegible]E 00

 *  GROUP NO.   9  SPLIT  FROM  GROUP   5  ON  VARIABLE    1 (AGE          )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   2    3    5
    N   =           66              MEAN = 0.25865136E 03        GROUP DEVIATION =-0.38798583E 02       SUM Y = 0.17071000E 05
 WEIGHT SUM =       66.             STD. DEV. = 0.97810882E 02               TSS(I) = 0.63142000E 06     SUM Y SQ. = 0.50468570E 07
 PCT OF TOTAL =     47.1            WTD. MEAN SQ. = 0.44154370E 07   (TSS(I)/TSS(T)) = 0.26335359E 00

 *  GROUP NO.  10  SPLIT  FROM  GROUP   7  ON  VARIABLE    4 (RACE         )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   1
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =            5              MEAN = 0.46439990E 03        GROUP DEVIATION = 0.16694995E 03       SUM Y = 0.23220000E 04
 WEIGHT SUM =        5.             STD. DEV. = 0.95634719E 02               TSS(I) = 0.45730000E 05     SUM Y SQ. = 0.11240660E 07
 PCT OF TOTAL =      3.6            WTD. MEAN SQ. = 0.10783360E 07   (TSS(I)/TSS(T)) = 0.19073136E-01

 *  GROUP NO.  11  SPLIT  FROM  GROUP   7  ON  VARIABLE    4 (RACE         )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   2    3
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =           12              MEAN = 0.26591650E 03        GROUP DEVIATION =-0.31533447E 02       SUM Y = 0.31910000E 04
 WEIGHT SUM =       12.             STD. DEV. = 0.20214299E 03               TSS(I) = 0.49034144E 06     SUM Y SQ. = 0.13388810E 07
 PCT OF TOTAL =      8.6            WTD. MEAN SQ. = 0.84853956E 06   (TSS(I)/TSS(T)) = 0.20451230E 00

 *  GROUP NO.  12  SPLIT  FROM  GROUP   9  ON  VARIABLE    3 (EDUC LEVEL   )   ✓
    VALUES  OF  PREDICTOR  INCLUDED  ARE   2
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =            5              MEAN = 0.32000000E 03        GROUP DEVIATION = 0.22550048E 02       SUM Y = 0.16000000E 04
 WEIGHT SUM =        5.             STD. DEV. = 0.75894653E 02               TSS(I) = 0.28800000E 05     SUM Y SQ. = 0.54080000E 06
 PCT OF TOTAL =      3.6            WTD. MEAN SQ. = 0.51200000E 06   (TSS(I)/TSS(T)) = 0.12011945E-01

 *  GROUP NO.  13  SPLIT  FROM  GROUP   9  ON  VARIABLE    3 (EDUC LEVEL   )   ✓
    VALUES  OF  PREDICTOR  INCLUDED  ARE   3
    N   =           61              MEAN = 0.25362294E 03        GROUP DEVIATION =-0.43827011E 02       SUM Y = 0.15471000E 05
 WEIGHT SUM =       61.             STD. DEV. = 0.97699508E 02               TSS(I) = 0.58225700E 06     SUM Y SQ. = 0.45060570E 07
 PCT OF TOTAL =     43.6            WTD. MEAN SQ. = 0.39238[illegible]E 07   (TSS(I)/TSS(T)) = 0.24284858E 00

 *  GROUP NO.  14  SPLIT  FROM  GROUP  13  ON  VARIABLE    4 (RACE         )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   1
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =           37              MEAN = 0.26281079E 03        GROUP DEVIATION =-0.34439160E 02       SUM Y = 0.97240000E 04
 WEIGHT SUM =       37.             STD. DEV. = 0.74603424E 02               TSS(I) = 0.20593000E 06     SUM Y SQ. = 0.27615020E 07
 PCT OF TOTAL =     26.4            WTD. MEAN SQ. = 0.25555720E 07   (TSS(I)/TSS(T)) = 0.85889577E-01

 *  GROUP NO.  15  SPLIT  FROM  GROUP  13  ON  VARIABLE    4 (RACE         )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   1    3
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =           24              MEAN = 0.23945833E 03        GROUP DEVIATION =-0.57991622E 02       SUM Y = 0.57470000E 04
 WEIGHT SUM =       24.             STD. DEV. = 0.12389313E 03               TSS(I) = 0.36438800E 06     SUM Y SQ. = 0.17445530E 07
 PCT OF TOTAL =     17.1            WTD. MEAN SQ. = 0.13761670E 07   (TSS(I)/TSS(T)) = 0.15[illegible]477EE 00

 *  GROUP NO.  16  SPLIT  FROM  GROUP   8  ON  VARIABLE    4 (RACE         )
    VALUES  OF  PREDICTOR  INCLUDED  ARE   1
 *** THIS  GROUP  IS  RETAINED  AS  ONE  OF  FINALS.
    N   =            7              MEAN = 0.31171411E 03        GROUP DEVIATION = 0.14764160E 02       SUM Y = 0.21820000E 04
 WEIGHT SUM =        7.             STD. DEV. = 0.78620056E 02               TSS(I) = 0.43267813E 05     SUM Y SQ. = 0.72342800E 06
 PCT OF TOTAL =      5.0            WTD. MEAN SQ. = 0.68014019E 06   (TSS(I)/TSS(T)) = 0.18046200E-01

 *  GROUP NO.  17  SPLIT  FROM  GROUP   8  ON  VARIABLE    4 (RACE         )
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THIS GROUP IS ... AS ONE OF FINALS.
        N =          30          MEAN = 0.27723315E 03     GROUP DEVIATION = -0.20216796E 02     SUM Y = 0.83170000E 04
   WEIGHT SUM =      30.     STD. DEV. = 0.90382324E 02          TSS(I) = 0.24506900E 06     SUM Y SQ. = 0.25508170E 07
PCT OF TOTAL =     21.4   STD. MEAN SQ. = 0.23057480E 07   (TSS(I)/TSS(T)) = 0.10721374E 00
```

*** ANALYSIS OF VARIANCE TABLE ***

SOURCE OF VARIATION	SUM OF SQUARES	DEGREE OF FREEDOM	MEAN SQUARE	F
TOTAL	0.23975130E 07	139.		
BETWEEN	0.64801800E 06	8.	0.81002250E 05	0.60650015E 01
WITHIN	0.17495950E 07	131.	0.13355684E 05	

6.06

RESIDUALS ARE NOT REQUESTED.

*** E N D ***

TIME IS NO 11-14-46(HH.MM.SS.)

LAST GROUP OF DATA HAS BEEN READ AND PROCESSED

AID IS TERMINATED

**FORTRAN ** STOP

// EXEC AX...,25,280,6000

* (A)UTOMATIC (I)NTERACTION (D)ETECTOR (MODEL 2) *

* * * S U M M-A R Y * * *

DEPENDENT VARIABLE 10 (AVG AFT TRNG)

WEIGHTED BY VARIABLE 0

** TOTAL GROUP

N = 140	MEAN = 0.39089990E 03	SUM Y = 0.54726000E 05	TSS = 0.35200800E 07
TOTAL WT SUM = 140.	STD. DEV. = 0.15856679E 03	SUM Y SQ. = 0.24912464E 08	

* GROUP NO. 2 SPLIT FROM GROUP 1 ON VARIABLE 6 (COMPLETE TR)
VALUES OF PREDICTOR INCLUDED ARE 0 1

N = 132	MEAN = 0.40700000E 03	GROUP DEVIATION = 0.16100097E 02	SUM Y = 0.53724000E 05
WEIGHT SUM = 132.	STD. DEV. = 0.14198163E 03	TSS(I) = 0.26609600E 07	SUM Y SQ. = 0.24526624E 08
PCT OF TOTAL = 94.3	WTD. MEAN SQ. = 0.21865064E 08	(TSS(I)/TSS(T)) = 0.75593734E 00	

* GROUP NO. 3 SPLIT FROM GROUP 1 ON VARIABLE 6 (COMPLETE TR)
VALUES OF PREDICTOR INCLUDED ARE 2
*** THIS GROUP IS RETAINED AS ONE OF FINALS.

N = 8	MEAN = 0.12525000E 03	GROUP DEVIATION = -0.25464990E 03	SUM Y = 0.10020000E 04
WEIGHT SUM = 8.	STD. DEV. = 0.18039661E 03	TSS(I) = 0.26034350E 06	SUM Y SQ. = 0.38584400E 06
PCT OF TOTAL = 5.7	WTD. MEAN SQ. = 0.12550090E 06	(TSS(I)/TSS(T)) = 0.73959529E-01	

* GROUP NO. 4 SPLIT FROM GROUP 2 ON VARIABLE 2 (SEX)
VALUES OF PREDICTOR INCLUDED ARE 2

N = 29	MEAN = 0.48334472E 03	GROUP DEVIATION = 0.92444824E 02	SUM Y = 0.14017000E 05
WEIGHT SUM = 29.	STD. DEV. = 0.16997485E 03	TSS(I) = 0.77488200E 06	SUM Y SQ. = 0.75739250E 07
PCT OF TOTAL = 20.7	WTD. MEAN SQ. = 0.67750430E 07	(TSS(I)/TSS(T)) = 0.22494993E 00	

* GROUP NO. 5 SPLIT FROM GROUP 2 ON VARIABLE 2 (SEX)
VALUES OF PREDICTOR INCLUDED ARE 1

N = 103	MEAN = 0.38930463E 03	GROUP DEVIATION = -0.53952637E 01	SUM Y = 0.39707000E 05
WEIGHT SUM = 103.	STD. DEV. = 0.12639648E 03	TSS(I) = 0.16455360E 07	SUM Y SQ. = 0.16952768E 08
PCT OF TOTAL = 73.6	WTD. MEAN SQ. = 0.15307232E 08	(TSS(I)/TSS(T)) = 0.46747118E 00	

* GROUP NO. 6 SPLIT FROM GROUP 5 ON VARIABLE 4 (RACE)
VALUES OF PREDICTOR INCLUDED ARE 0

N = 71	MEAN = 0.40785913E 03	GROUP DEVIATION = 0.16959228E 02	SUM Y = 0.28958000E 05
WEIGHT SUM = 71.	STD. DEV. = 0.11447540E 03	TSS(I) = 0.93042800E 06	SUM Y SQ. = 0.12741212E 08
PCT OF TOTAL = 50.7	WTD. MEAN SQ. = 0.11810784E 08	(TSS(I)/TSS(T)) = 0.26432008E 00	

* GROUP NO. 7 SPLIT FROM GROUP 5 ON VARIABLE 4 (RACE)
VALUES OF PREDICTOR INCLUDED ARE 1 3

N = 32	MEAN = 0.33590625E 03	GROUP DEVIATION = -0.54993652E 02	SUM Y = 0.10749000E 05
WEIGHT SUM = 32.	STD. DEV. = 0.13703387E 03	TSS(I) = 0.60090500E 06	SUM Y SQ. = 0.42115610E 07
PCT OF TOTAL = 22.9	WTD. MEAN SQ. = 0.36106960E 07	(TSS(I)/TSS(T)) = 0.17070776E 00	

* GROUP NO. 8 SPLIT FROM GROUP 6 ON VARIABLE 7 (CLOCK HRS)
VALUES OF PREDICTOR INCLUDED ARE 1 2 3

N = 44	MEAN = 0.39745434E 03	GROUP DEVIATION = -0.34455566E 01	SUM Y = 0.17048000E 05
WEIGHT SUM = 44.	STD. DEV. = 0.13222525E 03	TSS(I) = 0.76927500E 06	SUM Y SQ. = 0.73745960E 07
PCT OF TOTAL = 31.4	WTD. MEAN SQ. = 0.65053210E 07	(TSS(I)/TSS(T)) = 0.21853906E 00	

```
* GROUP NO.  9 SPLIT FROM GROUP  6 ON VARIABLE   7 (CLOCK HRS        )
    VALUES OF PREDICTOR INCLUDED ARE    4    5
          N =         27        MEAN = 0.44111110E 03      GROUP DEVIATION = 0.30211181E 02      SUM Y = 0.11910000E 05
 WEIGHT SUM =         27.       STD. DEV. = 0.64658125E 02         TSS(I) = 0.11298300E 06   SUM Y SQ. = 0.53666160E 07
PCT OF TOTAL =      19.3        WTD. MEAN SQ. = 0.52536330E 07   (TSS(I)/TSS(T)) = 0.32090710E-01

* GROUP NO. 10 SPLIT FROM GROUP  4 ON VARIABLE   4 (RACE             )
    VALUES OF PREDICTOR INCLUDED ARE    0
          N =         18        MEAN = 0.53944433E 03      GROUP DEVIATION = 0.14854443E 03      SUM Y = 0.97100000E 04
 WEIGHT SUM =         18.       STD. DEV. = 0.10552303E 03         TSS(I) = 0.20043200E 06   SUM Y SQ. = 0.54384360E 07
PCT OF TOTAL =      12.9        WTD. MEAN SQ. = 0.52380040E 07   (TSS(I)/TSS(T)) = 0.56939613E-01

* GROUP NO. 11 SPLIT FROM GROUP  4 ON VARIABLE   4 (RACE             )
    VALUES OF PREDICTOR INCLUDED ARE    1    3
*** THIS GROUP IS RETAINED AS ONE OF FINALS.
          N =         11        MEAN = 0.39154541E 03      GROUP DEVIATION = 0.64550781E 00      SUM Y = 0.43070000E 04
 WEIGHT SUM =         11.       STD. DEV. = 0.20205827E 03         TSS(I) = 0.44910300E 06   SUM Y SQ. = 0.21354890E 07
PCT OF TOTAL =       7.9        WTD. MEAN SQ. = 0.16863860E 07   (TSS(I)/TSS(T)) = 0.12758315E 00

* GROUP NO. 12 SPLIT FROM GROUP  8 ON VARIABLE   1 (AGE              )
    VALUES OF PREDICTOR INCLUDED ARE    3
          N =         18        MEAN = 0.42605541E 03      GROUP DEVIATION = 0.35155517E 02      SUM Y = 0.76690000E 04
 WEIGHT SUM =         18.       STD. DEV. = 0.11892293E 03         TSS(I) = 0.25456800E 06   SUM Y SQ. = 0.35219870E 07
PCT OF TOTAL =      12.9        WTD. MEAN SQ. = 0.32574190E 07   (TSS(I)/TSS(T)) = 0.72318792E-01

* GROUP NO. 13 SPLIT FROM GROUP  8 ON VARIABLE   1 (AGE              )
    VALUES OF PREDICTOR INCLUDED ARE    4    5
          N =         26        MEAN = 0.36073071E 03      GROUP DEVIATION =-0.30169189E 02      SUM Y = 0.93790000E 04
 WEIGHT SUM =         26.       STD. DEV. = 0.13435257E 03         TSS(I) = 0.46931600E 06   SUM Y SQ. = 0.38526090E 07
PCT OF TOTAL =      18.6        WTD. MEAN SQ. = 0.33832930E 07   (TSS(I)/TSS(T)) = 0.13332534E 00

* GROUP NO. 14 SPLIT FROM GROUP  7 ON VARIABLE   7 (CLOCK HRS        )
    VALUES OF PREDICTOR INCLUDED ARE    1
*** THIS GROUP IS RETAINED AS ONE OF FINALS.
          N =          5        MEAN = 0.15120000E 03      GROUP DEVIATION =-0.23969991E 03      SUM Y = 0.75600000E 03
 WEIGHT SUM =          5.       STD. DEV. = 0.21804073E 03         TSS(I) = 0.23770881E 06   SUM Y SQ. = 0.35201600E 06
PCT OF TOTAL =       3.6        WTD. MEAN SQ. = 0.11430719E 06   (TSS(I)/TSS(T)) = 0.67529320E-01

* GROUP NO. 15 SPLIT FROM GROUP  7 ON VARIABLE   7 (CLOCK HRS        )
    VALUES OF PREDICTOR INCLUDED ARE    2    3    4    5
          N =         27        MEAN = 0.37011110E 03      GROUP DEVIATION =-0.20788810E 02      SUM Y = 0.99930000E 04
 WEIGHT SUM =         27.       STD. DEV. = 0.77226196E 02         TSS(I) = 0.16102500E 06   SUM Y SQ. = 0.38595450E 07
PCT OF TOTAL =      19.3        WTD. MEAN SQ. = 0.36985200E 07   (TSS(I)/TSS(T)) = 0.45744698E-01

* GROUP NO. 16 SPLIT FROM GROUP 13 ON VARIABLE   5 (EMPLY REF TR)
    VALUES OF PREDICTOR INCLUDED ARE    2
*** THIS GROUP IS RETAINED AS ONE OF FINALS.
          N =          9        MEAN = 0.41833325E 03      GROUP DEVIATION = 0.27433349E 02      SUM Y = 0.37650000E 04
 WEIGHT SUM =          9.       STD. DEV. = 0.90104248E 02         TSS(I) = 0.73069000E 05   SUM Y SQ. = 0.16480930E 07
PCT OF TOTAL =       6.4        WTD. MEAN SQ. = 0.15750240E 07   (TSS(I)/TSS(T)) = 0.20757765E-01

* GROUP NO. 17 SPLIT FROM GROUP 13 ON VARIABLE   5 (EMPLY REF TR)
    VALUES OF PREDICTOR INCLUDED ARE    3
          N =         17        MEAN = 0.33023510E 03      GROUP DEVIATION =-0.60664794E 02      SUM Y = 0.56140000E 04
 WEIGHT SUM =         17.       STD. DEV. = 0.14300423E 03         TSS(I) = 0.35057700E 06   SUM Y SQ. = 0.22065160E 07
PCT OF TOTAL =      12.1        WTD. MEAN SQ. = 0.18539390E 07   (TSS(I)/TSS(T)) = 0.99893460E-01
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 *  GROUP NO. 18 SPLIT FROM GROUP 17 ON VARIABLE   9 (WELFARE?       )
    VALUES OF PREDICTOR INCLUDED ARE    2
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =          11          MEAN = 0.35400000E 03       GROUP DEVIATION =-0.35899902E 02        SUM Y = 0.38940000E 04
  WEIGHT SUM =       11.       STD. DEV. = 0.13818300E 03                TSS(I) = 0.21004000E 06     SUM Y SQ. = 0.15885160E 07
 PCT OF TOTAL =    7.9        WTD. MEAN SQ. = 0.13784760E 07      (TSS(I)/TSS(T)) = 0.59469096E-01

 *  GROUP NO. 19 SPLIT FROM GROUP 17 ON VARIABLE   9 (WELFARE?       )
    VALUES OF PREDICTOR INCLUDED ARE    1
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =           6          MEAN = 0.28666650E 03       GROUP DEVIATION =-0.10423340E 03        SUM Y = 0.17200000E 04
  WEIGHT SUM =        6.       STD. DEV. = 0.14313957E 03                TSS(I) = 0.12293363E 06     SUM Y.SQ. = 0.61600000E 06
 PCT OF TOTAL =    4.3        WTD. MEAN SQ. = 0.49306638E 06      (TSS(I)/TSS(T)) = 0.34923531E-01

 *  GROUP NO. 20 SPLIT FROM GROUP 12 ON VARIABLE   8 (CLASS COST     )
    VALUES OF PREDICTOR INCLUDED ARE    1
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =           5          MEAN = 0.50319995E 03       GROUP DEVIATION = 0.11230005E 03        SUM Y = 0.25160000E 04
  WEIGHT SUM =        5.       STD. DEV. = 0.19227324E 03                TSS(I) = 0.18484500E 06     SUM Y SQ. = 0.14508960E 07
 PCT OF TOTAL =    3.6        WTD. MEAN SQ. = 0.12660510E 07      (TSS(I)/TSS(T)) = 0.52511588E-01

 *  GROUP NO. 21 SPLIT FROM GROUP 12 ON VARIABLE   8 (CLASS COST     )
    VALUES OF PREDICTOR INCLUDED ARE    2   3
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =          13          MEAN = 0.39638452E 03       GROUP DEVIATION = 0.54446191E 01        SUM Y = 0.51530000E 04
  WEIGHT SUM =       13.       STD. DEV. = 0.46840148E 02                TSS(I) = 0.28522000E 05     SUM Y SQ. = 0.20710910E 07
 PCT OF TOTAL =    9.3        WTD. MEAN SQ. = 0.20425690E 07      (TSS(I)/TSS(T)) = 0.81026554E-02

 *  GROUP NO. 22 SPLIT FROM GROUP 10 ON VARIABLE   8 (CLASS COST     )
    VALUES OF PREDICTOR INCLUDED ARE    1   2
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =          11          MEAN = 0.58009082E 03       GROUP DEVIATION = 0.18919092E 03        SUM Y = 0.63810000E 04
  WEIGHT SUM =       11.       STD. DEV. = 0.11339391E 03                TSS(I) = 0.14144000E 06     SUM Y SQ. = 0.38429990E 07
 PCT OF TOTAL =    7.9        WTD. MEAN SQ. = 0.37015590E 07      (TSS(I)/TSS(T)) = 0.40180903E-01

 *  GROUP NO. 23 SPLIT FROM GROUP 10 ON VARIABLE   8 (CLASS COST     )
    VALUES OF PREDICTOR INCLUDED ARE    3   4
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =           7          MEAN = 0.47557125E 03       GROUP DEVIATION = 0.84471386E 02        SUM Y = 0.33290000E 04
  WEIGHT SUM =        7.       STD. DEV. = 0.41851776E 02                TSS(I) = 0.12261000E 05     SUM Y SQ. = 0.15954370E 07
 PCT OF TOTAL =    5.0        WTD. MEAN SQ. = 0.15831760E 07      (TSS(I)/TSS(T)) = 0.34831595E-02

 *  GROUP NO. 24 SPLIT FROM GROUP 15 ON VARIABLE   1 (AGE            )
    VALUES OF PREDICTOR INCLUDED ARE    2   3   5
        N =          21          MEAN = 0.38004760E 03       GROUP DEVIATION =-0.10852295E 02        SUM Y = 0.79810000E 04
  WEIGHT SUM =       21.       STD. DEV. = 0.60042331E 02                TSS(I) = 0.75708000E 05     SUM Y SQ. = 0.31088670E 07
 PCT OF TOTAL =   15.0        WTD. MEAN SQ. = 0.30331590E 07      (TSS(I)/TSS(T)) = 0.21507404E-01

 *  GROUP NO. 25 SPLIT FROM GROUP 15 ON VARIABLE   1 (AGE            )
    VALUES OF PREDICTOR INCLUDED ARE    4
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
        N =           6          MEAN = 0.33533325E 03       GROUP DEVIATION =-0.35596650E 02        SUM Y = 0.20120000E 04
  WEIGHT SUM =        6.       STD. DEV. = 0.11253702E 03                TSS(I) = 0.75987500E 05     SUM Y SQ. = 0.75067800E 06
 PCT OF TOTAL =    4.3        WTD. MEAN SQ. = 0.67469950E 06      (TSS(I)/TSS(T)) = 0.21586865E-01

 *  GROUP NO. 26 SPLIT FROM GROUP  9 ON VARIABLE   8 (CLASS COST     )
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   VALUES OF PREDICTOR INCLUDED ARE     1    2
      N =          19           MEAN = 0.43094726E 03        GROUP DEVIATION = 0.40047363E 02          SUM Y = 0.81880000E 04
   WEIGHT SUM =    19.          STD. DEV. = 0.61909088E 02           TSS(I) = 0.72822000E 05       SUM Y SQ. = 0.36014180E 07
   PCT OF TOTAL =    13.6       WTD. MEAN SQ. = 0.35285960E 07   (TSS(I)/TSS(T)) = 0.20487595E-01

 * GROUP NO. 27 SPLIT FROM GROUP  9 ON VARIABLE   8 (CLASS COST  )
   VALUES OF PREDICTOR INCLUDED ARE    3    4
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =           8           MEAN = 0.46525000E 03        GROUP DEVIATION = 0.74350097E 02          SUM Y = 0.37220000E 04
   WEIGHT SUM =     8.          STD. DEV. = 0.64747573E 02           TSS(I) = 0.33538000E 05       SUM Y SQ. = 0.17651980E 07
   PCT OF TOTAL =     5.7       WTD. MEAN SQ. = 0.17316500E 07   (TSS(I)/TSS(T)) = 0.95276236E-02

 * GROUP NO. 28 SPLIT FROM GROUP 24 ON VARIABLE   5 (EMPLY BEF TR)
   VALUES OF PREDICTOR INCLUDED ARE    2
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =           5           MEAN = 0.40479980E 03        GROUP DEVIATION = 0.13099902E 02          SUM Y = 0.20240000E 04
   WEIGHT SUM =     5.          STD. DEV. = 0.67618403E 02           TSS(I) = 0.22861250E 05       SUM Y SQ. = 0.84217600E 06
   PCT OF TOTAL =     3.6       WTD. MEAN SQ. = 0.81931475E 06   (TSS(I)/TSS(T)) = 0.64945220E-02

 * GROUP NO. 29 SPLIT FROM GROUP 24 ON VARIABLE   5 (EMPLY BEF TR)
   VALUES OF PREDICTOR INCLUDED ARE    1
      N =          16           MEAN = 0.37231250E 03        GROUP DEVIATION = -0.15987402E 02         SUM Y = 0.59570000E 04
   WEIGHT SUM =    16.          STD. DEV. = 0.55241500E 02           TSS(I) = 0.48826000E 05       SUM Y SQ. = 0.22666910E 07
   PCT OF TOTAL =    11.4       WTD. MEAN SQ. = 0.22178650E 07   (TSS(I)/TSS(T)) = 0.13870705E-01

 * GROUP NO. 30 SPLIT FROM GROUP 26 ON VARIABLE   8 (CLASS COST  )
   VALUES OF PREDICTOR INCLUDED ARE    1
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =           7           MEAN = 0.46257128E 03        GROUP DEVIATION = 0.71671386E 02          SUM Y = 0.32380000E 04
   WEIGHT SUM =     7.          STD. DEV. = 0.75039978E 02           TSS(I) = 0.39417000E 05       SUM Y SQ. = 0.15372220E 07
   PCT OF TOTAL =     5.0       WTD. MEAN SQ. = 0.14978050E 07   (TSS(I)/TSS(T)) = 0.11197753E-01

 * GROUP NO. 31 SPLIT FROM GROUP 26 ON VARIABLE   8 (CLASS COST  )
   VALUES OF PREDICTOR INCLUDED ARE    2
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =          12           MEAN = 0.41250000E 03        GROUP DEVIATION = 0.21600097E 02          SUM Y = 0.49500000E 04
   WEIGHT SUM =    12.          STD. DEV. = 0.43128677E 02           TSS(I) = 0.22321000E 05       SUM Y SQ. = 0.20641960E 07
   PCT OF TOTAL =     8.6       WTD. MEAN SQ. = 0.20418750E 07   (TSS(I)/TSS(T)) = 0.63410475E-02

 * GROUP NO. 32 SPLIT FROM GROUP 29 ON VARIABLE   7 (CLOCK HRS   )
   VALUES OF PREDICTOR INCLUDED ARE    2    3
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =          11           MEAN = 0.35436352E 03        GROUP DEVIATION = -0.35936376E 02         SUM Y = 0.38980000E 04
   WEIGHT SUM =    11.          STD. DEV. = 0.43044372E 02           TSS(I) = 0.20381000E 05       SUM Y SQ. = 0.14016900E 07
   PCT OF TOTAL =     7.9       WTD. MEAN SQ. = 0.13813090E 07   (TSS(I)/TSS(T)) = 0.57899244E-02

 * GROUP NO. 33 SPLIT FROM GROUP 29 ON VARIABLE   7 (CLOCK HRS   )
   VALUES OF PREDICTOR INCLUDED ARE    4    5
 *** THIS GROUP IS RETAINED AS ONE OF FINALS.
      N =           5           MEAN = 0.41179980E 03        GROUP DEVIATION = 0.23499902E 02          SUM Y = 0.20590000E 04
   WEIGHT SUM =     5.          STD. DEV. = 0.58489730E 02           TSS(I) = 0.17105250E 05       SUM Y SQ. = 0.86500100E 06
   PCT OF TOTAL =     3.6       WTD. MEAN SQ. = 0.84789575E 06   (TSS(I)/TSS(T)) = 0.48593319E-02


                  * * *   ANALYSIS OF VARIANCE TABLE   * * *

     SOURCE OF           SUM OF            DEGREE OF          MEAN
     VARIATION           SQUARES           FREEDOM            SQUARE           F
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T O T A L	0.49[illegible]E 07	139.		
BETWEEN	0.156M2400E 07	16.	0.9R015000E 05	0.6176635RE 01
WITHIN	0.19516400E 07	123.	0.15868R17E 05	

RESIDUALS ARE NOT REQUESTED.

* * * E N D * * *

TIME IS NOW 11-19-11(HH.MM.SS.)

LAST GROUP OF DATA HAS BEEN READ AND PROCESSED

AID IS TERMINATED

**FORTRAN ** STOP

// EOJ

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