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An economic evaluation of the training and technology program, Oak Ridge, Tennessee, 1966-1970

Samuel Thomas Cooper

To the Graduate Council:

I am submitting herewith a dissertation written by Samuel Thomas Cooper entitled "An economic evaluation of the training and technology program, Oak Ridge, Tennessee, 1966-1970." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Agricultural Economics.

David Brown, Major Professor

We have read this dissertation and recommend its acceptance:

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AN ECONOMIC EVALUATION OF THE TRAINING AND TECHNOLOGY PROGRAM, OAK RIDGE, TENNESSEE, 1966-1970

A Dissertation

Presented for the

Doctor of Philosophy

Degree

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Samuel Thomas Cooper

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ABSTRACT

Training and Technology (TAT), a skill development program at Oak Ridge, Tennessee, has been training people for entry level skills since 1966. This study utilized data collected by TAT in 1972. The surveyed covered 472 graduates who were trained between 1966 and 1971, from areas as diverse as rural Appalachia and Chicago. This study compared the trainees according to whether they had rural or urban backgrounds; their sociodemographic characteristics; attitudes toward work, coworkers, and mobility; and post-training experiences including income. Initially, tabular comparisons were made. In the second portion of the analysis, multiple regression was utilized to examine the effect of (1) rural or urban background and (2) training year on hourly wage. Hourly wage was used as a proxy for income because virtually all trainees worked 40 hours per week and tenure on the job was unknown. Variables which were controlled in the analysis were age, education, training area, number of jobs since training, employment status prior to entering training, training year, years since training, and rural and urban background. Hourly wage was the independent variable. Regressions were run for the total group and each individual training year. The regressions were run twice, once including and then excluding the rural and urban background variables. Regressions were then run for the rural and urban groups separately.

Findings in the tabulated profiles showed that rural trainees were, on the average, older, the rural trainees were nearly all white while half of the urban trainees were nonwhite, and more rural trainees

had graduated from high school but fewer had gone to college. Rural trainees had fewer post-training adjustment problems but did experience greater difficulty in adapting to shift work. In other characteristics the trainees were quite similar.

The regression findings indicated consistently that being male, white, employed at entry to training and holding a training related job contributed positively to wages.

These and the other independent variables included in the analysis explained a higher percent of the variation in wages of the rural trainees than they did of urban trainees' wages. However, there appeared to be little overall difference between the rural and urban groups in their wage success and the effects of various background characteristics on these wages.

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CHAPTER I

INTRODUCTION

Appalachia has a history of problems in manpower development. Historically, educational attainment has been low, unemployment high, and cultural adjustment after migration has often presented severe problems. Indeed, many of today's urban problems have been nothing more than rural problems which were exported to cities and concentrated in slums and ghettos. Often problems of racial strife, social instability and urban poverty involve people who can trace their origins to Appalachia and the lack of preparation for self-support in an urban setting.

Many Appalachians never finish high school and a large portion of those who do cannot read or write at a fifth grade proficiency, with many doing even worse in mathematics. The efforts of the Appalachian Regional Commission have alleviated this situation somewhat; there has been little opportunity for skill or vocational training in many of the public schools. So the absence of a salable skill and of the basic education required for the acquisition of such skills is a problem to many Appalachians, both rural and urban.[1]

One approach to alleviating this problem is the Training and Technology (TAT) program in Oak Ridge, Tennessee. It is best

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[1]An interesting discussion of the need for educational reform in Appalachia can be found on pages 183-194 in *Change in Rural Appalachia: Implications for Action Programs*, ed. Photiadis and Schwaryweller (Philadelphia: University of Pennsylvania Press, 1970).

described by the following excerpt from the publication *Training and Technology: An Industrial/Education Partnership for Industrial Manpower Development* (1972):

> TAT was a direct outgrowth of a 1965 study of Southern manpower resources conducted for the U.S. Department of Labor by Oak Ridge Associated Universities. This study, reported in the publication, *Resources for Southern Manpower Development*, recognized the problem of unemployment and underemployment in the face of an overall national shortage of skilled workers and pointed to the existence of available training capacity in industry that might be applied, in combination with the resources of universities and public and private manpower agencies, toward a solution of the problem.
>
> In 1968, following successful completion of its initial two-year demonstration phase, TAT began the transition from a largely experimental effort to one combining experimentation, demonstration, and assessment activities in industrial manpower development with regular training operations. At the same time, funding shifted from that provided solely until then by the Department of Labor and the U.S. Department of Health, Education, and Welfare under MDTA, to a diversified pattern of participation that included substantial financial support by other federal as well as state and local agencies. Under these new arrangements, the target group for training became persons who are "disadvantaged," as defined by Department of Labor criteria, as well as being unemployed or underemployed. More recently, this focus has been expanded to include substantial numbers of returning Vietnam veterans, who receive full GI educational benefits while enrolled in the program, and residents of federally designated "redevelopment" counties.
>
> The principal operating partners in TAT are: Oak Ridge Associated Universities (ORAU), a corporate university management group sponsored by 43 colleges and universities throughout the Southern region, which conducts programs of education, information, and research under contract with the U.S. Atomic Energy Commission; and the Nuclear Division, Union Carbide Corporation, AEC contractor for the operation of the Commission's major Oak Ridge nuclear production and research facilities.
>
> ORAU is responsible for overall coordination of the worker-training program; development experimentation, and assessment activities; trade-related instruction in mathematics and science; counseling and supportive services to trainees; and reporting to sponsors and others with manpower interests. Union Carbide supervisors and skilled draftsmen provide classroom, shop, and laboratory instruction in the six main areas of TAT occupational training--drafting, electronics, machining, mechanical and process operations, physical testing, and welding.
>
> Training activities are carried out at the AEC's Oak Ridge

Y-12 Plant, a defense installation with advanced capabilities in chemical and metallurgical technology, which is one of four installations--including also the Oak Ridge and Paducah (Kentucky) Gaseous Diffusion Plants and Oak Ridge National Laboratory--operated by Union Carbide for the Commission. One of the AEC's most versatile facilities, the Y-12 Plant, supports such activities as process development, heavy engineering, and specialized production, including fabrication of nuclear-weapons components.

TAT now enrolls 400 or more trainees annually in two six-month training cycles. Those served include both potential new employees who are prepared to the entry level for industrial employment in their chosen training area and persons currently employed in low-skill, dead-end jobs, for whom the emphasis is on upgrading and advancement. Of the total, approximately one-half are potential or present AEC contractor employees and the other half are veterans. In addition, TAT provides training services under contract with local Concentrated Employment (CEP) and state Work Incentive (WIN) programs as well as directly for industry in cooperation with state manpower agencies.

To date, the worker-training program has prepared nearly 2,000 previously disadvantaged, underemployed, or unemployed persons for entry into the industrial work force. Graduates have been employed in 170 different industrial job titles related to their TAT training, with excellent performance and retention records. Approximately one-third have been placed in jobs within the Atomic Energy Commission contract system and the balance with more than 60 other industrial employers, both regionally and nationally.

This experience with the total employment process, from recruitment through training, placement, and on-the-job followup, has demonstrated that standards of high industrial quality can be maintained in a comprehensive program that takes into account the special services required for disadvantaged persons. Further, the program has demonstrated that disadvantaged persons with at least a sixth grade functional academic level can successfully complete training in six months and be placed in entry-level skilled and technical jobs.

With the beginning of its sixth year in 1971-72, TAT now serves as an Industrial Training Center available to Atomic Energy Commission contracting organizations throughout the eastern half of the U.S.[2]

While it is generally accepted that training programs such as

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[2]The published reports of TAT are available by writing Training and Technology, Manpower Development Division, Oak Ridge Associated Universities, Oak Ridge, Tennessee 37830.

this are beneficial, as indicated in past studies conducted by TAT, no comparative analysis of trainees has been conducted. As TAT has changed policies, recruiting targets and training approaches, it could well be that the changes in the program were very helpful in some instances and not in others. How have people with diverse socio-economic backgrounds benefited as the training program has changed? How have trainees with rural backgrounds fared relative to those with urban backgrounds throughout the training program?

It is this latter question to which the study reported in this dissertation is specifically addressed. Such questions are important if the TAT program is to develop effective ways of dealing with the work related problems of trainees, and if the TAT model is to be used by other agencies in developing manpower training programs. Also, knowledge of differences in the benefits derived from training by trainees, if they exist, will be of value in developing recruiting policies, counseling services, and training programs. Thus, this study should bring to light information of value to people involved in the administration of TAT, to trainees, and to people involved in manpower training elsewhere.

This study took advantage of a survey conducted by TAT of its graduates. The study emphasized the differences and similarities between trainees with rural and urban backgrounds. Also, the trainees were grouped by the year in which training was undertaken. The analysis of these groups centered around post-training earnings, experiences, and their relationships to selected background characteristics.

I. PREVIOUS RESEARCH

One of the earliest books published on manpower retraining programs was the work edited by Somers entitled *Retraining the Unemployed* (1968). This book is a compilation of papers reporting research results sponsored by the Ford Foundation. The papers presented in the book are studies of Area Redevelopment Act (ARA) and Manpower Development Training Act (MDTA) training programs and represent some of the pioneering works in the area of the economics of vocational training.

The most thorough economic analysis in the book is a report by Cain and Stromsdorfer on retraining programs in West Virginia. This was an economic evaluation of government sponsored training of participants in a West Virginia program in 1961 and 1962. These researchers surveyed people who had completed the training and compared their post-training work experiences to the experiences of a control group which had no contact with the training program. The measurement of cost was a straightforward summation of government expenditures plus the opportunity cost of the individual taking the training. Benefits consisted of additional wages earned by trainees over and above those earned by the control groups. Economic environment, age, race, sex, and educational level were controlled for both groups.

The earning advantage was then evaluated utilizing three techniques of investment analysis. First, the pay-back period was investigated. It was found that society's costs were repaid by increased earnings in 13 months and the individual's costs repaid in 3.5 months.

Next, utilizing the assumption that income differences between the control group and sample group decline linearly to retirement, the annual rate of return to the investment in training was computed. It was found to be 92 percent for all participants. Finally, the capital value of the discounted stream of net earnings through time was computed. Two discount rates, 5 percent and 10 percent, were used and the capital values were $10,336 and $6,533, respectively.

The general conclusions of Cain and Stromsdorfer were that training pays, more so for men than women and more so for younger men than older men.

Solie (1968) presented a paper on the effects of retraining in Tennessee. He utilized data from a four-month ARA training project conducted in Campbell and Claiborne Counties from February 19 to June 18, 1962. Persons included in the analysis were program completes, non-completes, rejects, and nonapplicants serving as the control group. The analysis focused on the importance of placement in training-related fields, employment since training and the permanence of benefits from retraining.

The results indicated that a majority of those who completed the program obtained training-related jobs. However, this was accounted for, to an unknown extent, by the extensive placement services of the program and the fact that the trainees were the "cream of the crop" of the unemployed work force. The latter was indicative of employers using the training program as a screening system for future employees. The results do indicate that training had a positive effect on the employment experience of the trainees. However, there was no evidence

whether this represented a net increase in employment or whether lesser trained employees were displaced. The evidence suggests that benefits from training are shortlived and Solie recommends an alternative hypothesis that the benefits of training vary directly with changes in the general level of unemployment.

Borus (1968) submitted a comprehensive paper on the effects of a Connecticut training program. Initially he reported the goals of the retraining programs to be: (1) to increase the nation's output; (2) to reduce the aggregate level of unemployment; (3) to reduce the costs of unemployment and public assistance; and (4) to reduce the unemployment of specific groups. Borus addressed his study to the following questions: (1) Did trainees' records indicate that they benefited from training? (2) What were the effects on aggregate output, unemployment, and unemployment compensation? (3) What groups in the labor force were retrained and were these the people for whom retraining was intended? To compensate for lack of homogeneity in classifications of workers in other studies, Borus used a six-fold classification of: (1) completed and utilized training; (2) completed but did not utilize training; (3) withdrew from training for employment; (4) withdrew from training without employment; (5) refused training because of employment; and (6) refused training without employment. The control groups used were groups (2), (4), and (6), as listed above. The evidence indicated that only limited success had been achieved in reaching the target groups with training. However, training had succeeded in accomplishing the other three objectives. Retraining had increased aggregate output by increasing workers' productivity,

had reduced aggregate unemployment by training workers for labor-short occupations and had reduced unemployment compensation payments by increasing the employment of trainees without diminishing the employment of nontrainees. Thus, the Connecticut experience, in contrast to the Tennessee experience, indicated that retraining can improve the nation's economy.

Main (1971), in an article entitled "A Nationwide Evaluation of M.D.T.A. Institutional Job Training," published in *The Journal of Human Resources*, reported a study of 1,200 trainees, 1,060 controls. His pre-training considerations were sex, race, age, education, marital status, number of dependents, pretraining employment, wages and financial situation. The backgrounds of the control and test groups were quite similar.

Main found in followup interviews that training had no effect on weekly wages of completors but the number of weeks worked was significantly greater than for the control group. The time trainees were fully employed was increased by 20 percent.

North American Conference on Cost Benefit Analysis of Manpower Policies (1969), a book of proceedings of a conference concerned with problems involved in cost-benefit analysis of manpower policies, is perhaps the most comprehensive recent publication in this area.

Weisbrod (1969) in the lead article, states the objective of government activities as allocative efficiency, economic stability, and distributional equity. Also, he states that manpower programs, while affecting skill levels, have no effect on the demand for labor. His major point is that manpower programs may but are not likely to

produce benefits in the first two goals that exceed costs. He concludes that some manpower analysis should be initiated even with the presumption that the program is not efficient in a cost-benefit sense. Even when programs are not economically efficient, there may be other aspects which justify the programs. Thus, it may be necessary to weigh distributional factors to justify manpower programs.

Dymond (1969) presented a paper entitled "The Role of Benefit Cost Analysis in Formulating Manpower Policy." In it he points out that dynamic cost-benefit analysis serves as an economic tool and as a decision-making technique for program administrators. As a dynamic technique, it provides a flow of benefit estimates from a program containing multiple activities. He concludes by saying, "It enables administrators to gauge the economic effects of deliberate changes within the program, to eliminate high cost elements or alternatively to gauge trade-offs associated with directing a program toward say the labor market's most disadvantaged group."

Perhaps the most interesting article in the *North American Conference* book is one by Einar Hardin (1969) in which he compares the major cost benefit analysis as applied to manpower retraining programs. He itemized his conclusions in two groups. The first eight items pertain to methods and the last four to results. In summary:

1. Progress has been made in estimating the consequences of training to society as a whole, to trainees and perhaps to government.
2. Further progress in estimating social benefits and costs requires the resolution of definitional problems.

3. Additional emphasis should be placed on estimating the variations in cost benefit relationships associated with training and conditional variables.
4. The followup period should be lengthened.
5. Methods of random sampling should be substituted for judgment sampling.
6. Research should be designed, as far as possible, to include the principle of randomization, and the choice between applicants and random samples of unemployed as control groups needs to be studied.
7. Efforts should be made to conduct evaluations in geographic areas where government data are available.
8. The use of nonlinear estimation methods and simultaneous equations approaches for estimating the impact of training should be explored.
9. Whether or not government regains the funds it spends on training is open to question.
10. There is adequate economic incentive for participation in programs of short duration.
11. Differences in concepts and methods limit the comparability of past research efforts.
12. There is a strong inverse relationship between the profitability and length of a training course.

In the winter, 1971, issue of the *Journal of Human Resources* Hu *et al.* (1971) reported on and compared the costs and benefits of general and vocational high schools in three major cities. The

statistical analysis utilized average monthly earnings before taxes, earnings for the six years following graduation, and the percent of time employed as dependent variables and the following as independent variables: city of graduation, type of school, sex, IQ, race, marital status, and father's education. The conclusion drawn from this analysis was that vocational graduates fare better financially than their counterparts, but that these extra benefits diminish through time.

Borus *et al.* (1971) published a study entitled "Benefit Cost Analysis of the Neighborhood Youth Corps: The Out of School Program in Indiana," in the *Journal of Human Resources*. Using increased productivity and increased employability as indicators of benefits, they attempted to evaluate the effectiveness of the two programs. Their analysis utilized regression techniques with the following independent variables: sex, average number of years of school completed, average age at interview, average family size, language spoken in the home, hometown, average number of hours in the program, and race. Total 1967 earnings was the dependent variable. From this model the following conclusions were drawn: (1) males enjoy large benefits with a large benefit cost ratio while females have very meager returns; (2) high school dropouts benefit more than graduates; and (3) there is a direct relationship between the length of the program and benefits derived.[3]

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[3]This is an interesting contrast with the findings of Hardin in his comparison of MDTA studies (1969).

II. THE DATA

The data for this study were taken from a survey of TAT graduates conducted by the Training and Technology branch of Oak Ridge Associated Universities in conjunction with the U.S. Atomic Energy Commission and Union Carbide Corporation.

The survey was conducted in 1972 and covered a sample of TAT graduates during the 1966-1972 period. The purpose of the survey was "to carry out a more thorough investigation of the 'post placement' period to gain in-depth information concerning the problems faced by TAT graduates in adjusting to regular employment and related community life." More specific goals were: (1) to define the adjustment period actually and temporarily; (2) catalog the adjustment problems of the trainees; (3) identify deficiencies in the TAT training program; and (4) to provide for sociodemographic and economic comparisons of TAT graduates. The questionnaire was designed accordingly and, as such, economic considerations were not its central theme.[4] (See Appendix for the questionnaire.)

The survey procedure used by TAT was described in their publication "Survey of Post-Placement Experience of TAT Graduates" and is as follows:

> I. Mailed Questionnaires
> A short mailout questionnaire was prepared and sent to all 1,659 TAT graduates in the spring of 1972. The primary purpose of this questionnaire was to locate graduates and to gather some

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[4] TAT has since published a report of the survey entitled *Training and Technology Postplacement Follow-Up* (1973).

general information on the kinds of problems graduates faced in the post-placement period [see Appendix]. A second questionnaire and a follow-up letter were mailed to those who did not respond to the first. Approximately 36% (N=592) of all TAT graduates responded to the two mailed questionnaires by the time the interviewing process started.

II. Sample Construction

Limited by the constraints of time and money, the project staff extracted a stratified random sample from the total graduate population of 1,659, from which 472 were finally contacted. Since TAT needed information about its more recent graduates, a larger proportion of graduates from the 1970-1972 period was included in the sample. This was the only major systematic bias in the sample and was dictated by the need for practical results. Statistics describing the total graduate population and the sample were computed for each of eight variables for which information was available on all trainees--race, sex, training area, HRD disadvantaged status, employment status at time of entry to TAT, entry educational level, state of origin, and whether the General Equivalency Degree (GED) had been obtained while at TAT.

There were *no* significant differences between the interviewed survey sample and the total population, except distribution according to training area. However, this single difference had no or negligible influence on the results. While there is no *absolute* way to ascertain if the nonsurveyed group differed from the interviewed group (short of interviewing *all* graduates), the statistics indicate that there were no critical differences between the sample and the total TAT graduate population.

III. STUDY OBJECTIVES

The central objective of this study was to ascertain whether there were significant differences in post-training earnings and work adjustments among (1) TAT graduates with rural backgrounds and those with urban backgrounds, and (2) among graduates of the various training years. Toward this objective, two analytical components were undertaken:

1. To develop descriptive profiles of each group using socio-demographic training and post-training data;

2. To analyze the impact of training, post-training experiences, and sociodemographic data on present wages.

IV. THE RURAL-URBAN DICHOTOMY

TAT has recruited trainees from areas as diverse as the rural mountains of Appalachia and the slums of Chicago. This diversity of backgrounds of trainees leads to many questions. Can one training program adequately serve the needs of all participants? Just how did trainees differ and what were their similarities? How have they fared in their post-training experiences? These are questions of relevance to the trainees, the program staff and administrators, and people involved in other training programs. So this study emphasized the dichotomy of trainees according to whether they had a rural or urban background.

The classifications of rural and urban were based on information provided by the trainees when they enrolled in TAT. However, the community classifications used by TAT did not provide a clearcut basis for making the rural-urban distinction. The classifications are: large city, suburb, small city, town or village, and rural. The problem arose with the classification of town or village. While not rural in the strictest sense of the word, the towns and villages were all located in the Appalachian area. It was assumed that the trainees from towns and villages would have social, cultural, and attitudinal characteristics more like those trainees from rural backgrounds than those from urban backgrounds. So the trainees from towns and villages were classified as rural for analytical purposes.

V. THE TRAINING YEAR DIVISIONS

TAT has historically been divided into two phases. The first phase consisted of two training cycles and the second phase was made up of three training cycles. Each training cycle represents a year of TAT operations. The year to year changes in the program designs and recruiting targets raise some questions. Do the trainees who graduate have basically the same characteristics from year to year? How do these characteristics affect the trainees' present wages? Thus, the backgrounds, training and post-training experiences of TAT graduates were analyzed by training cycles.

TAT Phase I consisted of two training cycles, the first 52 weeks in length (initiated in 1966) and the second 42 weeks long (started in 1967). The length of the training periods differed because operational and teaching experience gained in the first year of experience was sufficient to permit a 10-week reduction in cycle length. The first cycle lasted from September 18, 1967, to June 3, 1968. Recruitment for Phase I was carried out in cooperation with the Tennessee Department of Employment Security (TDES) and Youth Opportunity Centers (YOC). During the first cycle recruiting was limited to 19 counties in East Tennessee, and it was expanded to the entire state in the second cycle. Recruiting efforts brought 3,057 applications for 356 training slots for both cycles combined.

The target group of Phase I was broadly defined as the unemployed and the underemployed. The selection process, which included aptitude and interest tests, training facility tours, and personal interviews, admitted only the "cream of the crop" to the program. Thus, the Phase I

trainees tended to be the best educated, the most employable, and have the best work histories of all Phase I applicants.

TAT Phase II consisted of a series of annual cycles which have continued since 1968. Graduates from the first three of these cycles were included in this study and were treated as separate entities. Phase II Cycle I began in the summer of 1968. It was in this cycle that emphasis was first put on recruiting the hard-core unemployed and the disadvantaged. The summer was devoted to a 12-week vocational orientation program designed to introduce the disadvantaged trainees to the mathematics, communications, and science courses needed for training. The summer program reflected a shift in emphasis from training the underemployed to training the disadvantaged. One hundred sixty-four persons took part in the summer program and 117 were admitted to training.

Another innovation in this cycle was the elimination of rigid course lengths. Trainees were permitted to progress at their own speed and were graduated when entry level skills were attained. As a trainee was graduated, he was replaced with a new trainee, allowing approximately 380 persons to be trained with only 190 slots. Training periods for any one person ranged from three months to one year, with the average being six months. Electronics operated on a 9-month program and the other training areas as 12-month programs.

Thus, the features which distinguish Phase II Cycle I from Phase I are: (1) an emphasis on training the disadvantaged, and (2) flexible training schedules.

Phase II Cycle II ran from October, 1969, to September, 1970.

The training program was essentially the same as Cycle I of this phase. The major changes were in the places from which trainees were recruited. Trainee selection was expanded geographically to include Chattanooga, West Virginia, Virginia, Kentucky, and Chicago. This eliminated the past homogeneity of trainees' backgrounds and brought new challenges to the program.

Another change was that training was scheduled for two six-month shifts of trainees. These were designed so that, as soon as a trainee achieved entrance level skills, he was replaced with a new trainee. This allowed 328 trainees to be graduated.

Phase II Cycle III ran from October, 1970, to September, 1971. In the first six months 181 trainees were enrolled. Recruiting for this training cycle emphasized minorities from urban areas and rural Appalachian residents. (Of the trainees, 40 percent were minorities and 75 percent disadvantaged.) A total of 271 trainees was graduated in 1971. The training program itself remained unchanged from the previous year.

VI. THE MODELS

Toward fulfilling the objectives of this study, two analytical approaches were used: (1) a tabular comparison of profiles of each group, and (2) multiple regression analysis.

Profiles

Profiles were straightforward tabular descriptions of the total sample and separate descriptions of those with rural and urban backgrounds and by training year. The profiles were based on personal

data, mobility, and work experience. The purpose of these profiles was to provide a comparison of trainees based on data broader than that utilized in the regression analysis.

Multiple Regression

Multiple regression was utilized in the analysis of the trainees' present wages. The nature of the data made it necessary to use dummy or 0,1 variables as well as continuous variables. The dummy variables were used on the nonquantifiable variables--sex, training area, education, race, marital status, employed at entry into the program, whether or not the present job is related to training, number of jobs since training, and year in which training was completed.

The training years 1966 and 1967 were not analyzed separately because of the low number of survey respondents in those two years. The dependent variable was average hourly wage. It was chosen as the indicator of income because all groups analyzed worked predominantly 40-hour weeks. There were six regression models developed utilizing the average hourly wages as the dependent variable. The models are presented below:

Model I. Y = average hourly wage

X_1-X_2 = sex; entered as a 0,1 variable

X_3-X_9 = training area; entered as 0,1 variable

X_{10}-X_{12} = education level grouped as less than high school, high school, and more than high school; entered as 0,1 variable

X_{13}-X_{14} = race categorized as white and nonwhite; entered as 0,1 variable

X_{15}-X_{16} = marital status; entered as 0,1 variable

X_{17}-X_{18} = employed at entry into the program; entered as 0,1 variable

X_{19}-X_{21} = job training-related at time of survey now categorized as yes, no, and some; entered as 0,1 variable

X_{22}-X_{25} = number of jobs since training, grouped as 1,2, and 3 or more; entered as 0,1 variable

X_{26}-X_{30} = year in which training was undertaken; entered as 0,1 variable

X_{31} = age

X_{32} = age squared entered to provide for a curvilinear function

This model was used for the total survey group and the rural and urban dichotomy.

Model II. This was identical to Model I except a dummy variable was entered for rural and urban backgrounds. This model was run only on the total survey group.

Model III. This model was similar to Model I except for the dummy variables for the year in which training was completed and for rural urban backgrounds. This model was run only on the total survey group.

X_{28} = number of years since training

X_{29} = number of years since training squared

This model was run on the total group and the rural-urban dichotomy.

Model IV. Model IV was identical to Model III except the dummy variables for rural-urban backgrounds were re-entered into the regression equation. This model was run on the total group only.

Model V. Model V was identical to Model IV except it excluded

rural-urban variables. This model was run on the total and training year groups.

Model VI. This model ignored the training year completely but had the rural-urban dummies entered. This model was run on the total and training year groups.

CHAPTER II

TRAINEE PROFILES

The first purpose of this study was to develop descriptive profiles of the trainees. The profiles were developed for the entire sample, those from rural and urban backgrounds, and by training year. The purposes of the profiles were to provide a comparison of rural and urban trainees and to permit an examination of the characteristics of trainees as the TAT program has evolved. The profiles were developed in a pattern following the design of the questionnaire (see Appendix). The profiles included information about personal background, mobility, and work experience. A summary of the profiles of rural and urban trainees is also provided to show the data used in the statistical analysis.

I. PERSONAL DATA

Sociodemographic Data

Sociodemographic data are presented on the following characteristics relative to trainees: (1) community lived in and training year; (2) education; (3) sex; (4) race; (5) marital status; (6) previous training; and (7) age.

Community lived in and training year. Throughout this study trainees from rural backgrounds were compared to those with urban backgrounds. Table I shows the community origins on which this classification was based for the total survey group, rural and urban trainees and by year starting with 1970 and going back to 1966.

TABLE I

COMMUNITY LIVED IN, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	63	--	--	--	--	--	46	--	5	--	4	--	5	--	3	--
Urban																
Large city	41	10	--	--	41	17	25	19	3	2	12	12	--	--	1	3
Suburb	22	5	--	--	22	9	11	8	7	6	4	4	--	--	--	--
Small city	173	43	--	--	173	74	52	40	56	51	37	36	14	45	14	42
Rural																
Town or village	75	18	75	43	--	--	16	12	22	20	23	23	7	23	7	21
Outlying areas	98	24	98	57	--	--	28	21	23	21	26	25	10	32	11	39
All	472	100	173	100	236	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

Of the 472 trainees interviewed, data on place of origin were not obtained on 63, or 13 percent. Those from rural backgrounds, defined above as rural plus town or village, numbered 173 and comprised 42 percent of the total sample. In the interyear comparisons a trend is found from 1968 to 1970, in which urban trainees increased in number relative to rural trainees. This is to be expected; these were years in which the training program changed from a localized East Tennessee recruiting policy to include large metropolitan areas such as Chicago and Chattanooga. This change in emphasis made these years especially interesting for the development of the trainee profiles.

Education. One feature of the trainees' educational levels of immediate interest is that no one who responded had less than an eighth grade education (Table II). While this is not conclusive, it does suggest a minimum educational level necessary for completion of program. This would be an implicit minimum because of efforts to recruit the hard-core disadvantaged and unemployed in 1968 and 1969. Sixty-five percent of the trainees had a twelfth grade education and 14 more had a high school graduate equivalency degree; 18 percent had post high school training ranging from some vocational school to three years of college; and only 17 percent of the survey group had less than a twelfth grade education. When rural and urban trainees are compared, little difference is found in educational levels. However, the interyear comparisons reflect the greater selectivity of the early years of training. In 1966 only one respondent had less than a twelfth grade education while in 1967 only two were below this level. Also in 1967, 28 percent of them had one year of college and 8 percent had two years

TABLE II

TRAINEES' EDUCATION, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	20	--	5	--	15	--	3	--	3	--	1	--	5	--	7	--
8th grade	4	1	1	1	3	1	4	2	--	--	--	--	--	--	--	--
9th grade	17	4	5	3	12	4	3	2	7	6	7	7	--	--	--	--
10th grade	23	5	8	5	15	5	8	5	7	6	7	7	1	3	--	--
11th grade	30	7	12	7	18	6	12	7	11	10	5	5	1	3	1	3
12th grade	295	65	114	66	181	64	117	66	72	63	75	70	14	46	17	61
Has GED	14	3	8	5	6	2	5	3	4	4	4	4	--	--	1	3
1 year college	46	10	13	8	33	12	19	11	10	9	5	5	10	32	3	10
2 years college	15	3	3	2	12	4	6	3	1	1	2	2	3	10	3	10
3 years college	3	1	1	1	2	1	1	1	1	1	--	--	--	--	1	3
Attended vocational school beyond high school	4	1	1	1	3	1	--	--	--	--	--	--	1	3	3	10
Completed vocational school beyond high school	1	--	1	1	--	--	--	--	--	--	--	--	1	3	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

of college. Concomitant with the emphasis on training the hard-core unemployed was a slight increase in the number of trainees with less than a twelfth grade education. In 1968, 19 percent of the trainees had less than a twelfth grade education, 22 percent of the 1969 trainees had this educational background and 16 percent of the 1970 trainees were in this category.

Age. On the average, trainees were in their early twenties for all groups except 1966, in which the average age was 28 (Table III). Age distributions of rural and urban trainees were quite similar, while the percentage of trainees under 20 diminishes through time to zero in 1966. Also, 1966 was unique with 42 percent of its trainees being in the 30-39 age range.

Sex. Female trainees made up 5 percent of the total training group (Table III). Three percent of the rural trainees were females while 7 percent of the urban trainees were females. This same pattern was found in the interyear comparisons, except for 1967 which had 12 percent females. These percentages probably reflect the fact that the TAT program emphasized jobs historically assigned to males.

Race. In the total group there were 65 percent whites and 35 percent nonwhites (Table III). However, of the rural trainees only 8 percent were nonwhite while 51 percent of the urban trainees were nonwhite. The percentage of nonwhites rose from 2 percent in 1966 and none in 1967 to 42 percent in 1970. This reflects the shifting emphasis in 1968 away from recruiting just in East Tennessee to urban ghettos.

Marital Status. Of the total group 38 percent were married

TABLE III

SOCIODEMOGRAPHIC CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age																
Average age	22[b]	--	24	--	22	--	22	--	22	--	23	--	23	--	28	--
Range	(5.6)[c]		(6.3)		(5.1)		(3.7)		(5.4)		(6.8)		(4.4)		(7.6)	
Under 20	117	26	28	16	89	32	68	38	27	24	20	20	2	6	--	--
20-29	276	61	115	66	161	57	105	59	71	64	61	61	26	84	13	39
30-39	44	10	20	12	24	9	3	2	10	9	14	14	3	10	14	42
40 and over	17	4	10	6	7	2	1	1	3	3	7	7	--	--	6	19
Sex																
Male	441	95	165	97	276	93	167	94	109	95	101	96	30	88	34	97
Female	25	5	5	3	20	7	10	6	6	5	4	4	4	12	1	3
Race																
White	296	65	159	92	137	49	103	58	67	60	64	64	30	100	31	86
Nonwhite	158	35	14	8	144	51	74	42	44	40	38	38	--	--	2	14
Marital Status																
Married	173	38	75	43	98	35	62	35	41	37	32	32	14	45	24	73
Other	280	62	98	57	182	65	114	65	70	63	70	70	17	55	9	27
Previous Training																
None	292	62	129	75	163	55	33	18	101	87	92	87	34	94	32	89
Less than 30 weeks	34	7	15	9	17	6	10	6	9	8	11	10	1	3	3	8
30 weeks	128	27	20	11	108	36	128	72	--	--	--	--	--	--	--	--
More than 30 weeks	18	4	9	5	11	3	7	4	6	5	3	3	1	3	1	3

[a]Percentages exclude nonresponses.

[b]This is an average age, not the number of respondents.

[c]Figures in parentheses are standard deviations.

at the time of the survey (Table III).[1] Forty-three percent of the rural trainees were married against only 35 percent of the urban trainees. The percentage of married trainees remained consistently around 35 percent from 1970 back through 1968. It then went up to 45 percent in 1967 and 73 percent in 1966. This large number of married trainees in 1966 and 1967 may be attributed to the efforts to recruit trainees who were most likely to succeed for those years. This resulted in recruiting older, more mature trainees (see Age above) who had had more time to marry.

Previous training. Previous training provided a unique situation in the profile (Table III). While 292 trainees had no prior training, those who did were divided into the categories of less than 30 weeks of training, 30 weeks, and more than 30 weeks. However, all of those 128 who had 30 weeks of training were in the 1970 training year. This accounted for 27 percent of the total sample. Excluding this group, only 11 percent of the sample who answered this question had received any previous training. Of these, 7 percent had less than 30 weeks of training and 4 percent had more than 30 weeks of training. Seventy-five percent of the rural trainees had no previous training while 55 percent of the urban trainees had none. This rural-urban difference reflects the 1970 training group which contained 108 urban trainees with 30 weeks of previous training.

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[1]For this study, nonmarried trainees includes single, divorced, widowed, or separated trainees.

Training Data

How the graduates in the sample were divided among the seven TAT training areas is shown in Table IV. Training in machine operations has been offered only since 1968. Chemical technology was offered in 1970 alone. It should be noted that there were no rural trainees in the chemical technology course.

Problems Upon Graduation

Because one of TAT's purposes is to experiment in new ways of training the unemployed and underemployed, it is essential to determine how they adjust to the world of work. Thus, no matter how skilled, if a trainee cannot get along with his family, coworkers, and employers, he is in almost no better position than a person who had received no training. Adjustment problems relative to the following areas are presented: (1) family and friends upon employment, and (2) personal adjustments upon graduation.

Sources of Problems Encountered with Family and Friends

Trainees were asked what problems they encountered with family and friends upon employment. The results are shown in Table V. The significance of this table is the number of trainees who said they had encountered no problems. Only 7 percent of the total group had had problems, 9 percent of the urban trainees and 4 percent of the rural trainees reported such problems. Given the small number of respondents, no pattern of problems could be ascertained for either the rural-urban or training year dichotomies.

TABLE IV

TRAINING AREA, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%a	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	6	--	3	--	3	--	1	--	1	--	1	--	2	--	1	--
Physical testing	65	14	21	12	44	15	18	10	19	17	10	10	15	43	3	9
Drafting	49	11	9	5	40	14	13	7	18	15	6	6	6	18	6	17
Machine operations	72	15	22	13	50	17	21	12	19	17	32	30	--	--	--	--
Machining	188	40	85	50	103	34	84	48	46	39	35	33	8	24	15	43
Welding	50	11	25	15	25	8	13	7	11	10	15	14	5	15	6	17
Electronics	31	7	8	5	23	8	17	10	2	2	7	7	--	--	5	14
Chemical technology	11	2	--	--	11	4	11	6	--	--	--	--	--	--	--	--
Total	482	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

TABLE V

SOURCES OF PROBLEMS ENCOUNTERED WITH FRIENDS OR FAMILY UPON EMPLOYMENT, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
None	439	93	167	96	272	91	164	92	103	89	102	96	34	94	36	100
Shift work	11	2	2	1	9	3	4	2	4	3	2	2	1	3	--	--
Relocation	7	2	1	1	6	2	3	2	3	3	1	1	--	--	--	--
Homesick	5	1	2	1	3	1	1	1	2	2	1	1	1	3	--	--
Other	10	2	1	1	9	3	6	3	4	3	--	--	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

Personal Adjustment Upon Graduation

Adjustment problems of only minor significance were encountered by a few of the trainees upon graduation. While no general pattern was found, several interesting contrasts were noted (Table VI). A significant feature is that over half of the trainees reported no adjustment problems. Of the 209 who had difficulty, 62 (30 percent) had rural backgrounds and 147 (70 percent) had urban backgrounds.

The major adjustment problem of the total group was shift work; the second problem resulted from the difficulty of the job; the third from inadequate finances; the fourth from transportation; and the fifth, finding a job. Further examination reveals that shift work was greater for the rural respondents; 37 percent of the rural respondents listed it as their major problem as against 18 percent of the urban trainees. Similarly, transportation was a problem for 12 percent of the total group; however, only 3 percent of the rural trainees against 16 percent of the urban trainees reported transportation a problem.

The interyear comparisons provide interesting results for the category of shift work. The incidence of problems adjusting to shift work increases back through time from 11 percent in 1970 to 38 percent in 1968, then it dropped to 14 percent in 1967 and rose to 23 percent in 1966. Several factors are relevant here. In 1970, there was an emphasis on recruiting military veterans who may have been acclimated to shift work as a result of their military training. On the other hand, the two high years, 1968 and 1969, were years in which training the hard-core unemployed and urban youth was emphasized and it might be expected that they would experience greater problems adjusting to

TABLE VI

ADJUSTMENT PROBLEMS ENCOUNTERED AFTER GRADUATION, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	263	--	111	--	152	--	93	--	54	--	64	--	29	--	23	--
Shift work	49	23	23	37	26	18	9	11	20	32	16	38	1	14	3	23
Job too difficult	36	17	9	15	27	19	18	20	9	15	6	14	1	14	2	15
Finding a job	20	10	5	8	15	10	15	18	3	5	2	5	--	--	--	--
Inadequate finances	31	15	9	15	22	15	16	19	7	11	2	5	2	29	4	31
Transportation	25	12	2	3	23	16	13	15	4	6	7	17	--	--	1	8
Finding housing	20	10	5	8	15	10	4	5	9	15	3	7	2	29	2	15
Personal conflicts	9	4	4	6	5	3	4	5	1	2	3	7	--	--	1	8
Company misleading	12	6	4	6	8	5	2	2	7	11	2	5	1	14	--	--
Other	7	3	1	2	6	4	4	5	2	3	1	2	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

shift work. There were too few respondents for the 1966 and 1967 training year to make inferences about the adjustments of these groups to shift work.

Another interesting feature of the interyear comparisons was 18 percent of the 1970 trainees gave finding a job as a major adjustment problem while 5 percent of the 1968 and 1969 trainees gave this problem and none of the 1966 and 1967 trainees gave this reason. This may reflect labor markets at the time of graduation. However, the 1966 and 1967 graduates had companies waiting to employ them.

II. MOBILITY

Labor mobility is a multifaceted concept. Two dimensions of mobility are geographic mobility and job mobility. The first involves moving from one geographic location to another and may or may not imply job mobility. Job mobility involves moving from one employer to another. Either type of mobility may but does not necessarily imply the other. A labor force must be capable of both types of mobility in the face of a labor market which is constantly in a state of flux. However, the confines of available data limited the emphasis in this analysis to geographic mobility.

The concept of mobility is frequently difficult for an individual to deal with in an *ex ante* situation, especially geographical mobility which requires leaving family and friends, entering a strange community, and establishing new relationships. The fact that this involves the entire family often makes it difficult for the trainees to anticipate how the family unit would react if faced with long-term unemployment,

a greatly reduced level of living, or an opportunity for significant economic advancement, these being common causes for moving. Thus, the answers provided the survey were only approximate indications of how the respondents would actually react in a situation highly conducive to a geographical move.

Data related to the mobility portion of the profile were of three types: (1) job related moves; (2) speculative moves; and (3) anticipated moves.

Job Related Moves

The concept of mobility consists not only of a move but also the number of moves and attitudes and problems involved. Thus, in this section the topics to be discussed will be: (1) whether the first job entailed a move; (2) how many times a trainee has moved since training; (3) attitudes of the family toward moving; and (4) problems encountered in relocating.

First job required a move. Given the philosophy behind TAT training that it serve as a research and demonstration project for training the unemployed, the underemployed and the hard core unemployed, this is a study of subgroups in the labor force. Whether the first job required a move (Table VII) would reflect the degree to which jobs were easily found locally, the trainee's desire to utilize his technical training if training related jobs were not available locally, and his intransigence or inclination toward moving. Indeed, that all but eight of the trainees have been employed since training and 28 percent of the trainees moved in order to acquire their first job indicates that adjustment to the labor market has been extensive.

TABLE VII

FIRST JOB REQUIRED A MOVE, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	29	--	12	--	17	--	10	--	7	--	6	--	3	--	3	--
No	218	72	120	75	198	70	130	77	68	62	72	72	24	73	24	73
Yes	125	28	41	25	84	30	38	23	41	38	28	28	9	27	9	29
Total	482	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

One of the most striking features of this table and the other tables in this chapter is the similarity of the experiences of the trainees. The portion of those who moved for their first job ranged from a high of 38 percent for 1969 trainees to a low of 23 percent for 1970 trainees. Between these two extremes the other graduates were grouped closely at 27, 28, and 29 percent. For the rural-urban dichotomy there was not a great difference with 25 percent and 30 percent respectively having to move for the first job.

When considering mobility of trainees through time, the number of jobs which have entailed moves may be an indication of their willingness to adjust to changes in the labor market. On the other hand, extensive moving could serve as an indicator of inadequate training resulting in poor skills, a series of short-term jobs or plain bad luck. Trainees who had graduated in the earlier years of training would reasonably expect to have had more opportunities to change jobs than those in the later years. Here the small size of the 1966 and 1967 sample groups impairs the effectiveness of the analysis.

Job related moves. Forty-five percent of the survey group had made one or more job related moves since graduating from TAT (Table VIII). Here it must be noted that this includes transfers and moves associated with changing job location but no change in jobs. When considering the total survey, 97 percent had moved no more than twice, indicating that trainees in general adjust geographically to changes in the labor market, but once moves are made they tend to be permanent. Rural trainees have been more mobile with 55 percent having had to move because of a job as opposed to 40 percent of the

TABLE VIII

NUMBER OF JOBS REQUIRING MOVES SINCE GRADUATION, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	257	54	78	45	179	60	102	57	57	49	54	51	22	61	22	60
1	165	35	72	42	93	31	63	35	46	40	41	39	10	28	5	14
2	37	8	16	9	21	7	8	5	9	8	11	10	3	8	6	17
3	10	2	4	2	6	2	5	3	2	1	--	--	1	3	2	6
4	2	.6	2	1	--	--	--	--	1	1	--	--	--	--	1	3
5	1	.4	1	1	--	--	--	--	1	1	--	--	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

urban trainees. However, this is to be expected as many rural trainees would have to move to urban areas to find employment. Once the first move is accounted for, the difference in moves made by rural and urban training drops to only 4 percent.

Also, the interyear comparisons turned out as might be expected. The first two years of training produced employees who have moved relatively fewer times than those who completed training in years when training the hard-core unemployed was emphasized. The range of those who had moved at least once but not more than twice was from 31 percent for 1966 to 48 percent for 1969.

Family attitudes toward moving. As mentioned above, geographic mobility can be expected to be influenced by non-economic factors among which family considerations may be especially important. Thus, trainees were asked whether their families had wanted to make the moves (Table IX). Because of the small number of respondents who replied, no general conclusions can be drawn from the data. But it is interesting that while the total group split with 40 percent responding "yes" and 40 percent responding "no," the responses were 45 percent "yes" and 30 percent "no" for rural trainees and 38 percent "yes" and 46 percent "no" for urban trainees. There was no discernible pattern in the interyear comparisons.

Problems encountered in moving. Much of a trainee's attitude toward mobility will be determined by experiences in moving before. Thus, trainees were asked what problems they had encountered in relocating (Table X). Again, the number of responses was very small, being 83 for the total sample, 27 for the rural trainees, and 56 for

TABLE IX

DID THE TRAINEE'S FAMILY WANT TO MOVE? TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	358	--	133	--	225	--	141	--	80	--	81	--	29	--	27	--
No	46	40	18	45	28	38	11	30	12	33	16	64	2	29	2	40
Yes	46	40	12	30	34	46	16	43	20	56	4	16	2	29	3	60
Do not know	22	20	10	25	12	16	10	27	4	11	5	20	3	42	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

TABLE X

PROBLEMS ENCOUNTERED IN RELOCATING, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response or had not moved	389	--	146	--	243	--	146	--	90	--	90	--	32	--	31	--
Finding suitable housing	38	45	14	51	24	44	17	54	12	46	6	38	--	--	3	60
Relocation costs	25	30	7	26	18	32	10	31	6	23	6	38	2	50	1	20
Homesickness	13	16	5	19	8	14	1	3	6	23	3	18	2	50	1	20
Finding a desirable job	3	4	--	--	3	5	2	6	--	--	1	6	--	--	--	--
Transportation to work	4	5	1	4	3	5	2	6	2	8	--	--	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

urban trainees. This in itself is interesting because 215 trainees reported that they had moved, 95 of these being rural and 120 being urban. Thus, a majority of the trainees who had relocated indicated no adjustment problems. Those who did indicate problems fell into a definite pattern, with the most frequent response being finding suitable housing, followed in turn by relocation costs and homesickness.

Speculative Moves

In two instances, trainees were asked to speculate on how they would deal with certain situations. These data have the drawbacks of information provided on an *ex ante* basis discussed in the introduction to this section. The order of discussion regarding trainee's willingness to move is: (1) if unemployed; (2) if employed but to gain a training related job; and (3) if they would not move, why not.

Would move if unemployed. The next questions pertained to a trainee's willingness to move if unemployed and his willingness to move to acquire a training related job (Tables XI and XII). All groups indicated a willingness to move if unemployed. Of the total group, 85 percent indicated that they would relocate if unemployed. Eighty-one percent of the rural trainees and 88 percent of the urban trainees indicated a willingness to move under those circumstances. The larger percentage of trainees in both groups who stated they would move if unemployed indicates a willingness on the part of the trainees to adjust geographically to changes in employment opportunities. The years 1966 and 1967 provided the extremes in the range of interyear comparisons, with 76 percent and 91 percent positive responses respectively. Results for the other years centered around 85 percent.

TABLE XI

IF UNEMPLOYED WOULD A TRAINEE RELOCATE TO GET A JOB? TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	22	--	8	--	14	--	8	--	4	--	5	--	3	--	2	--
No	67	15	32	19	35	12	23	14	16	14	17	17	3	9	8	24
Yes	383	85	133	81	250	88	147	86	96	86	84	83	30	91	26	76
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentage excludes nonresponses.

TABLE XII

IF EMPLOYED BUT NOT IN A TRAINING RELATED AREA, WOULD A TRAINEE RELOCATE FOR A TRAINING RELATED JOB? TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	28	--	12	--	16	--	11	--	7	--	3	--	3	--	4	--
No	95	21	43	27	52	18	31	19	21	19	24	23	7	21	12	37
Yes	349	79	118	73	231	82	136	81	88	81	79	77	26	79	20	63
Total	472	100	172	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

Would move if employed. The response on willingness to move if employed to acquire a training related job yielded a total positive response of 79 percent (Table XII). Seventy-three percent of the rural trainees and 82 percent of the urban trainees responded affirmatively. Rural positive responses were 73 percent and urban positive responses were 82 percent. Interyear responses adhered to previously set patterns with the range going from a low of 63 percent in 1966 to a high of 81 percent in 1969 and 1970. It must be kept in mind that this question was predicated upon being employed. Considering this and the problems of dealing with mobility in an *ex ante* sense, this researcher has serious reservations about the dependability of these results. It could well be that in this particular instance the trainees gave answers that they felt the agency which had provided them with training wanted to hear.

Would not move. Those who indicated that they would not move were asked why and the results are shown in Table XIII. Not all the alternative choices will be discussed here because either few responded or all groups responded basically in the same manner. It should be noted that the major reason for not moving given in all groups was family and friends. It is interesting that the category "children" was seldom used. This may be because the category "family and friends" could have been interpreted to include them.

Two categories in which rural and urban graduates especially differed were insufficient money and owning a business or home. Five percent of the rural respondents stated that insufficient money was their reason for not moving while 20 percent of the urban respondents

TABLE XIII

PRIMARY REASONS TRAINEES WOULD NOT MOVE, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	274	--	89	--	185	--	95	--	69	--	71	--	19	--	20	--
No explanation	26	13	10	12	16	14	9	11	7	15	5	14	3	18	2	13
Family and friends	44	23	23	27	21	18	15	18	9	19	12	34	6	35	2	13
Children	5	2	2	2	3	3	2	2	1	2	1	3	--	--	1	6
Money (insufficient)	27	14	4	5	23	20	20	24	3	6	2	6	1	6	1	6
Business or own home[b]	17	8	14	17	3	3	2	2	3	6	3	9	3	18	6	38
Cold climate	8	4	4	5	4	4	5	6	3	6	--	--	--	--	--	--
Would not live in city	5	2	2	2	3	3	2	2	2	4	--	--	--	--	1	6
Other	66	34	25	30	41	36	28	34	19	40	12	34	4	24	3	19
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

[b]This reflects trainees who are immobile because they own either a home or business.

gave this reason. The training year of 1970 had 24 percent indicating that insufficient money was the reason they would not move. But in any of the other years only 6 percent regarded this as the major reason.

The category, insufficient money, is not clearly defined in the questionnaire. The answers to the question could imply either a permanent intransigence toward moving or only a temporary reason for not moving. Thus, the value of this result is in doubt due to the unclear nature of its interpretation.

The second category in which rural and urban graduates showed noticeable differences was owning a business or home. While 17 percent of the rural trainees gave this as their major reason for not wanting to move, only 3 percent of the urban trainees did so. This may reflect the larger number of graduates of urban origin who were not home owners. Also, nearly one-third of the urban trainees were under 20 years of age while only 16 percent of the rural trainees were under this age. It is reasonable to assume that home or business ownership varies directly with age and, thus, rural trainees would use this reason more than urban trainees.

Anticipated Moves

Trainees were asked if they anticipated moving in the foreseeable future. This served as an indicator of labor market adjustment and reverse migration. The topics discussed are: (1) do you plan to move; and (2) if so, why.

Planned moves. When asked whether they planned to move in the foreseeable future, the majority response was in the negative (Table XIV). Fewer rural trainees indicated plans to move than

TABLE XIV

TRAINEES WHO PLAN TO MOVE IN THE FORESEEABLE FUTURE, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	8	2	3	2	5	2	1	1	4	3	3	3	--	--	--	--
No	282	60	115	66	167	56	99	55	64	55	68	64	24	67	27	75
Yes	182	38	55	32	127	42	78	44	48	42	35	33	12	33	9	25
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

urban trainees. Thirty-one percent of the rural trainees indicated that they planned to move as did 42 percent of the urban trainees. This seems consistent with trainees' responses about their willingness to move (Tables XI and XII, pages 42 and 43).

The responses for the interyear comparisons were somewhat varied with 55 percent saying "no" for 1970, 1969, and 1968, and 67 percent and 75 percent in 1967 and 1966, respectively. This is to be expected as the longer it is after training, the more "settled" a trainee and his family are likely to feel.

Why moves are planned. When asked why they planned to move, as shown in Table XV, the majority in all groups responded that it was for a better house. This would indicate that the moves did not necessarily reflect either geographical mobility or job changes. Indeed, they may reflect the prosperity that comes with the employment resulting from training and manifests itself in the desire for better housing. The acquisition of better housing does require a sizable cash outlay. Thus, it is not surprising that the years 1966 and 1967 have the highest percent of respondents giving this reason, for they would have had more time to earn and save the necessary money.

It should be noted here that there are redundancies in the choices offered trainees for wanting to move. Primary among these are the categories "family desires," which could be taken to include almost all the other categories and "nicer neighborhood," which overlaps the better housing category. So when considering this table, these overlaps must be kept in mind.

It is also interesting that the three job-related reasons for

TABLE XV

PRIMARY REASONS TRAINEES PLAN TO MOVE, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	290	--	118	--	172	--	103	--	66	--	70	--	25	--	26	--
Family desires	18	10	5	9	13	10	9	12	4	8	4	11	--	--	1	10
Nearer relatives	5	3	1	2	4	3	2	3	2	4	1	3	--	--	--	--
Better pay	9	5	6	11	3	2	4	5	2	4	3	8	--	--	--	--
Nicer neighborhood	6	3	2	4	4	3	5	7	--	--	1	3	--	--	--	--
Job in field	9	5	5	9	4	3	4	5	4	8	--	--	--	--	1	10
Higher level job	3	2	1	2	2	1	2	3	1	2	--	--	--	--	--	--
Better house	87	47	26	47	61	49	27	36	23	48	23	64	8	73	6	60
Other	45	25	9	16	36	29	22	29	14	26	4	11	3	27	2	20
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

planning to move (better pay, job in field, and higher level job) together accounted for only 12 percent of the total responses, 22 percent of the rural responses and 6 percent of the urban responses.

The interyear comparisons show larger percentages of the graduates of the earlier training years giving "desire for better housing" as the major reason for planning to move. This may be expected by the need for sizable savings often needed to acquire better housing. Thus, these trainees have had the time needed to accumulate these savings.

III. WORK EXPERIENCE

In developing the portion of the trainee's profile related to post-training jobs and work experience, work histories were developed to the third job back through time. Thus, they are reported as "present job," "second job" (this being the job just previous to that held at the time of the survey), and "third job" (being the two jobs prior to the one held at the time of the survey). However, responses drop off rapidly on the third job and in a later table the third job is not reported.

The work related data were categorized as two types--that information which related to employment and wages and that which dealt with problems at work.

Employment and Wages

Data on employment and wages are presented on the following topics: (1) the number of trainees presently employed; (2) the number of jobs held; (3) wages; and (4) whether work is training related.

Present employment. Trainees were asked about their present employment status (Table XVI). The most significant item of this table is that 10 percent of all responding trainees were unemployed at the time of the survey. Eleven percent of the rural trainees were unemployed as opposed to 9 percent of the urban trainees. As would be expected, the most recent trainees had the highest unemployment rate with it diminishing through 1967. The higher rate for 1966 was surprising and cannot be explained in terms of the available information about that particular trainee group or the TAT program for that year; it could be that the small sample size led to a distorted percentage not representative of the total 1966 group.

Number of jobs. Holding only one or two jobs since training may reflect stability and desirability as a worker; if several jobs have been held it could reflect flexibility, job mobility or the inability to maintain employment (Table XVII). In any event, most trainees had held only one or two jobs since TAT training. Perhaps the most striking aspect of this table is the relatively uniform percentage of each group which had held only one job. Indeed, the rural-urban percentages were nearly identical. It would be expected that those who had completed training earlier would have had more time in which to change jobs. This expectation was borne out by the percentages who had held two jobs--17 percent, 22 percent, and 28 percent, respectively, for 1970, 1969, and 1968. The first two years, 1966 and 1967, do not fit the pattern but this is attributable to the small sample size in these two years. When considering those who had held three, four, or five jobs, the number was too small to make a reliable pattern discernible.

TABLE XVI

TRAINEES' CURRENT EMPLOYMENT STATUS, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	2	--	1	--	1	--	--	--	--	--	--	--	--	--	2	--
Unemployed	45	10	19	12	26	9	22	12	13	11	6	6	1	3	3	9
Employed	425	90	153	88	272	91	156	88	103	89	100	94	35	97	31	91
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

TABLE XVII

NUMBER OF JOBS HELD BY TRAINEES SINCE TRAINING, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	8	2	4	2	4	1	7	4	1	1	--	--	--	--	--	--
1	294	61	107	61	187	63	123	68	68	58	68	64	16	44	19	53
2	108	23	38	22	70	22	30	17	25	22	30	28	16	44	7	19
3	50	11	20	12	30	10	17	10	15	13	7	7	4	12	7	19
4	10	2	3	2	7	2	--	--	6	5	1	1	--	--	3	9
5	2	1	1	1	7	2	1	1	1	1	--	--	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

Wages. Trainees' wages were used in this study as an indicator of the impact of training on their economic well-being. Beginning and ending hourly wages for the last three jobs are reported here (Table XVIII).

The beginning wage of the present job for the total survey group was $2.85 and the rural and urban averages were close to this. A pattern of lower beginning wages for earlier training groups was expected because of the general increase in the wage rate since that time.

Conversely, one would expect present wages to be higher for earlier graduates because of seniority and increased productivity from the perfection of job skills by trainees. This pattern did not develop as anticipated in beginning wages. The two highest years for beginning wages were 1968 and 1969. While 1966 and 1970 had the nearly identical starting wage of $2.75 and $2.77, respectively, the lowest beginning wage was in 1967.

The average present wage for the total survey group was $3.37. The average rural trainee was earning $3.49 while the average urban trainee was earning $3.29 at the time of the survey. This difference may be explained in part by the predominance of rural trainees in the first two years of the program (see Table I, page 22). The interyear comparisons are much as expected with the wages rising from $2.94 for 1970 graduates to $3.91 for 1966 graduates. The only aberration in the pattern was 1967, with a wage of $3.22 corresponding to its abnormally low beginning wage.

A further way of comparing the groups is the change in wages

TABLE XVIII

AVERAGE BEGINNING AND ENDING WAGES FOR THE LAST THREE JOBS HELD, TAT GRADUATES SURVEYED, 1972

	Total	Rural	Urban	1970	1969	1968	1967	1966
	dollars							
Present Job								
Beginning wage	2.85	2.87	2.84	2.77	2.98	2.95	2.58	2.75
	(.80)[a]	(.81)	(.79)	(.86)	(.84)	(.67)	(.71)	(.64)
	n=462	n=169	n=293	n=170	n=115	n=106	n=35	n=36
Present wage	3.37	3.49	3.29	2.94	3.51	3.76	3.22	3.91
	(1.06)	(1.14)	(1.00)	(.89)	(1.05)	(1.02)	(1.05)	(1.15)
	n=459	n=169	n=292	n=170	n=114	n=106	n=35	n=36
Second Job								
Beginning wage	2.78	2.94	2.68	2.55	2.98	3.00	2.63	2.49
	(1.03)	(1.05)	(1.01)	(.91)	(1.46)	(.76)	(.55)	(.58)
	n=164	n=62	n=102	n=45	n=46	n=38	n=20	n=15
Final wage	3.22	3.40	3.12	2.64	3.34	3.60	3.69	3.07
	(1.27)	(1.31)	(1.24)	(.94)	(1.59)	(1.05)	(1.21)	(1.01)
	n=162	n=61	n=101	n=45	n=45	n=38	n=19	n=15
Third Job								
Beginning wage	2.64	2.75	2.59	2.45	2.71	2.54	2.73	2.87
	(.87)	(.93)	(.84)	(.55)	(.71)	(1.11)	(1.02)	(1.36)
	n=60	n=23	n=37	n=16	n=23	n=8	n=3	n=10
Final wage	2.92	3.11	2.81	2.80	2.98	2.59	2.91	3.27
	(.98)	(1.03)	(.95)	(.74)	(.89)	(1.18)	(1.27)	(1.32)
	n=60	n=23	n=37	n=16	n=23	n=8	n=3	n=10

[a]Figure in parenthesis is the standard deviation.

since the trainees started their present jobs. For the total survey group wages had increased 52 cents, while they had increased 62 cents for rural trainees and 45 cents for urban trainees. Rural trainees' wages outstripped urban trainees' wages by 38 percent. In the interyear comparisons, we would expect a pattern of wage changes similar to that discussed above. And, indeed, they do parallel the pattern for present wages. The increase in wages starts at 22 cents for 1970 trainees and increases to $1.16 for 1966 trainees--the single deviation being 1967 with only a 66 cent increase.

When queried about a second job, the number of respondents dropped to a total of 162. The average beginning wage for second jobs was $2.78. But unlike the first-job responses, average beginning wages of rural and urban trainees differed by 26 cents, with rural trainees enjoying the higher wage. Again, the interyear comparisons of beginning wages did not follow the anticipated pattern discussed above but paralleled the pattern set in the first job. The 1970 group had the expected low starting wages while 1969 and 1968 trainees had the unanticipated higher wages, and 1967 and 1966 had wages much as expected. The final wage for the second job was $3.22 for 1967. The year 1966 was lower than expected with a final wage of $3.07.

The number of trainees who held three jobs was too small to yield any wage comparison.

Training related work. Trainees were asked whether they were employed at jobs that were training-related (Table XIX). The responses were categorized "no," "yes," and "some." The inquiry was extended back to the third job, but again responses on the third job were very

TABLE XIX

WAS WORK TRAINING RELATED? TAT GRADUATES SURVEYED, 1972

		Total		Rural		Urban		1970		1969		1968		1967		1966	
		No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Present Job																	
Now	No	152	33	55	33	97	33	81	47	32	28	26	25	10	28	3	8
	Yes	255	55	101	60	154	53	66	39	74	64	64	61	22	61	29	81
	Some	55	12	13	7	42	14	23	14	9	8	15	14	4	11	4	11
When hired	No	170	37	58	34	112	38	87	51	38	33	32	30	9	25	4	11
	Yes	245	53	98	58	147	50	64	37	70	61	60	57	23	64	28	78
	Some	49	10	13	8	36	12	20	12	7	6	14	13	4	11	4	11
Second Job																	
When ended	No	77	46	18	28	59	56	28	61	23	43	16	37	8	40	2	13
	Yes	78	47	37	62	41	39	16	35	20	50	21	49	9	45	12	74
	Some	11	7	6	10	5	5	2	4	3	7	6	14	3	15	2	13
When hired	No	85	51	18	29	67	63	33	70	27	57	15	40	8	40	2	13
	Yes	72	43	37	60	35	33	11	23	17	36	21	55	11	55	12	74
	Some	11	6	7	11	4	4	3	7	3	7	2	5	1	5	2	13
Third Job																	
When ended	No	33	55	9	39	24	65	10	62	14	66	5	63	2	67	2	20
	Yes	17	28	9	39	8	22	4	25	7	33	2	25	1	33	3	30
	Some	10	17	5	22	5	13	2	13	2	1	1	12	--	--	5	50
When hired	No	35	50	9	39	26	70	11	69	14	61	6	74	2	67	2	20
	Yes	16	23	8	35	8	22	5	31	6	26	1	13	1	33	3	30
	Some	19	27	6	26	3	8	--	--	3	13	1	13	--	--	5	50

[a]Percentages exclude nonresponses.

small and only the total, rural, and urban figures will be considered here. Of the total, rural and urban groups, 33 percent in each said that their present job was not training related when surveyed, while 55 percent, 60 percent, and 53 percent, respectively, stated that their job was training related at the time of the survey. There has been very little change in the percentage of graduates performing training related tasks since they acquired their first job. Indeed, the essence of this table is that there has not been much adjustment either toward or away from training related skills since graduation.

Employment Problems

The TAT survey provided information about three additional aspects of employment adjustments for which rural-urban and training group comparisons were made: (1) reasons for job termination; (2) dislikes about job; and (3) dislikes about coworkers.

Job terminations. When asked why they had left their previous jobs, there were 179 responses, of which 64 were by rural trainees and 115 by urban trainees (Table XX). While 47 percent of the rural trainees stated that it was for a better job, only 23 percent of urban trainees gave this reason. This may reflect a pattern of rural trainees leaving training, returning home to work and later migrating to better jobs in urban areas. The other categories of interest were "terminated" and "laid off." Only 14 percent of the rural trainees listed these categories as reasons for leaving their last job, while 30 percent of the urban trainees listed them. Although no firm conclusions can be drawn from this, it suggests that rural trainees possess a greater ability to hold a job than do urban trainees.

TABLE XX

REASONS TRAINEES LEFT THEIR PREVIOUS JOB, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	293	--	109	--	183	--	116	--	67	--	71	--	18	--	21	--
Found better job	57	31	30	46	27	24	6	9	14	29	15	42	9	49	4	28
Terminated	19	10	3	5	16	14	10	16	6	12	2	6	--	--	1	6
Laid off	24	13	6	9	18	16	9	15	8	17	3	9	2	11	2	14
Location	21	12	7	11	14	12	9	15	5	10	2	6	2	11	3	20
Job completed	3	2	--	--	3	3	2	3	1	2	--	--	--	--	--	--
Problems with coworkers	6	3	2	3	4	3	2	3	2	4	2	4	--	--	--	--
Transportation	3	2	1	2	2	2	--	--	--	--	1	3	2	11	--	--
Low pay	18	10	6	9	12	10	15	24	4	8	4	10	1	6	3	20
School	7	4	2	3	5	4	3	5	2	4	1	3	1	6	--	--
Military	3	2	1	2	2	2	--	--	1	2	1	3	1	6	--	--
Change fields	3	2	3	5	--	--	1	2	1	2	--	--	--	--	1	6
Didn't like the work	10	6	2	3	8	7	3	5	3	6	3	9	--	--	1	6
Employer misleading	5	3	1	2	4	3	2	3	2	4	1	3	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

The interyear comparisons showed little of interest except that terminations and layoffs accounted for considerably more of the job changes by 1970 and 1969 trainees than by those from other years. There were not enough responses in these categories in the other years to establish a pattern except that finding a better job was the dominant single reason given in all years.

Dislikes about job. Trainees' attitudes about their work were queried (Table XXI). The responses to the questions "What do you dislike most about your job?" have to be interpreted with caution. The problem arises from the fact that no provision was made for non-responses. When the questionnaires were edited by TAT, nonrespondents were included in the category "interpersonal relations." Therefore, this category cannot be meaningfully analyzed.

The characteristics of jobs most disliked by the total sample group were specific working conditions, low pay and shift work. Rural and urban trainees responded in approximately the same proportions to all categories except shift work; 18 percent of the rural trainees noted shift work as what they disliked most about their job, whereas this was true for only 8 percent of the urban trainees.

The other point of interest in this table comes from the inter-year comparisons. It would be expected, as shown in Table XVIII (page 55) that the longer a trainee is in the work force the higher will be his average hourly wage. When the complaint of low pay is considered, it would be expected that the proportion of responses in this category would diminish through time. This is substantiated by the years 1970, 1969, and 1968 where the instances of this complaint declined from 17 percent to 6 percent.

TABLE XXI

TRAINEES' DISLIKES ABOUT THEIR JOBS, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Interpersonal relations	172	35	53	30	119	40	55	31	42	36	50	47	9	25	16	44
Shift work	56	12	31	18	25	8	14	8	20	17	14	13	4	11	4	11
Location	12	3	6	4	6	2	4	2	1	1	5	5	1	3	1	3
Transportation	8	2	4	2	4	1	2	1	2	2	1	1	1	3	2	6
Low pay	58	12	22	13	36	12	30	17	12	10	6	6	8	22	2	6
General working conditions	32	7	9	5	23	8	12	7	10	9	7	7	2	6	1	3
Specific working conditions	61	13	18	10	43	14	27	15	16	14	9	8	4	11	5	13
Monotonous routine	29	6	15	9	14	5	13	7	3	3	9	8	3	8	1	3
Don't like the work in general	22	5	9	5	13	4	13	7	5	4	--	--	1	3	3	8
Company policy	22	5	6	4	16	6	8	5	5	4	5	5	3	8	1	3
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

Dislikes about coworkers. The final question in developing the work related portion of the profile pertained to what trainees disliked about their coworkers (Table XXII). The significance of this table is found in the absence of responses. Eighty-nine percent of the total survey group, 96 percent of the rural trainees and 84 percent of the urban trainees failed to reply. From this it can be implied that the vast majority of trainees did not have what they considered to be substantial problems with their coworkers. Of those 54 trainees who did indicate a reason for disliking coworkers, only 7 were rural. This and the low number of respondents in each year makes further analysis of this table impractical.

IV. SUMMARY PROFILE

The intent of this summary profile was to show for rural and urban trainees the data to be used in the regression analysis.

These data were taken from the sociodemographic and work experience tabulations discussed in the previous section. An examination of the percentage columns (Table XXIII) shows that relative to urban trainees, rural trainees are older, are predominantly white, and have more often finished high school. The two groups are similar in being employed in training related work, but rural trainees tend to favor machining, welding, and machine operations. The majority of both groups was employed just prior to training.

TABLE XXII

TRAINEES' MAIN DISLIKES ABOUT COWORKERS, TAT GRADUATES SURVEYED, 1972

	Total		Rural		Urban		1970		1969		1968		1967		1966	
	No.	%[a]	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No response	418	--	166	--	252	--	146	--	102	--	100	--	34	--	36	100
Racism	16	29	1	14	15	31	7	22	7	50	2	33	--	--	--	--
Not getting along	9	17	2	29	7	15	7	22	--	--	1	17	1	50	--	--
Generation gap	10	19	2	29	8	17	5	16	2	14	2	33	1	50	--	--
Back biting	5	9	1	14	4	9	5	16	--	--	--	--	--	--	--	--
Competition	14	26	1	14	13	28	8	24	5	36	1	17	--	--	--	--
Total	472	100	173	100	299	100	178	100	116	100	106	100	36	100	36	100

[a]Percentages exclude nonresponses.

TABLE XXIII

SUMMARY RURAL-URBAN PROFILE, TAT GRADUATES SURVEYED, 1972

	Rural		Urban	
	No.	%	No.	%
Age (years)	24	--	22	--
Sex				
Male	165	97	276	93
Female	5	3	20	7
Race				
White	159	92	137	49
Nonwhite	14	8	144	51
Education				
Less than high school	26	16	48	16
High school	122	74	187	64
Some college	17	10	57	20
Marital Status				
Married	75	43	98	35
Other	98	57	182	65
Present Job Training Related				
When hired				
No	58	34	112	38
Yes	98	58	148	50
Some	13	8	36	12
Now				
No	55	33	97	33
Yes	101	60	154	53
Some	13	7	42	14
Training Area				
Physical testing	21	12	44	15
Drafting	9	5	40	14
Mechanical operations	22	13	50	17
Machining	85	50	103	34
Welding	25	15	25	8
Electronics	8	5	23	8
Chemical technology	--	--	11	4
Employed at Entry to Training				
Yes	105	61	174	60
No	65	39	122	40
Number of Jobs				
0	4	2	4	1
1	107	61	187	63
2	38	22	10	22
3	20	12	30	10
4	3	2	7	2
5	1	1	7	2

CHAPTER III

RELATIONSHIPS BETWEEN WAGES AND SELECTED TRAINEE CHARACTERISTICS

The purpose of this chapter is to present the results of the regression analysis which relate sociodemographic and training characteristics to hourly wages for all classifications of trainees. Regression analysis was used to more clearly define the tabular relationships revealed in the last chapter. In other words, certain relationships may have been obscured in the straight tabular comparisons such as the influence of age, sex, or race on wages. Thus, multiple regression was utilized to hold constant the effect on wages of each of the variables.

I. VARIABLES IN THE ANALYSIS

The independent variables common to all models were age, sex, education, whether the job was training-related, marital status, training area, number of jobs since training and employment status at entry to training. The variables for training year, number of years since training, and rural and urban background were excluded in some models and included in others to provide estimates of their explanatory values. Each variable is explained further below.

Average Hourly Wage

The dependent variable average hourly wage was used as an indicator of income associated with the graduate's occupation. Here it must be noted that the present wage cannot be attributed entirely

to training as the survey group would have had income had they not undergone training.

Age

In the labor market, a person's age may be an asset up to a point or a liability beyond a point. An older person may be hired in preference to a younger person because of experience and established work attitudes. On the other hand, a younger person may be preferred because he has more years of productive service left. Thus, no hypothesis was made pertaining to the impact of age on hourly wage. Age was a continuous variable in the model.

Age squared was entered to provide for a curvilinear function relative to age. This was done because as a worker gets older the rate of change in his earnings could either "snowball" because of experience or level off due to a loss of productivity related to aging.

Education

Educational attainment is generally believed to be related to job skill development and the acquisition of positive work attitudes.

While years of formal education ignores such factors as quality, type, and scope of schooling and experience gained in other fields, it was the only measure available from the survey. It was hypothesized that there is a positive relationship between educational attainment and hourly wages. Education was treated as a dummy variable and the classes were: less than high school, high school, and more than high school. The more-than-high-school classification served as the base.

Training Area

While the relative effect of training area on hourly wages could not be anticipated, it was crucial to allow for such in the analysis. If there are significant differences in the impact on hourly wages, it will be most important to trainees in selecting a training area and to the program administrators in selecting program priorities.

The areas in which training was offered were: physical testing, drafting, mechanical operations, machining, welding, electronics, and chemical technology. Electronics served as the base for the years 1968 and 1969 and for the rural-urban comparisons. However, in 1970, a group of urban trainees was trained in chemical technology. Thus, for the analysis of the total, urban and 1970 groups, chemical technology was used as the base. The use of two training areas as the base was probably unwise and would not be repeated if the analysis were to be done again.

Number of Jobs Since Training

The number of jobs which a trainee has held since training may have several implications for his economic situation. As discussed in Chapter II, holding only one or two jobs suggests employee stability. Holding three or four jobs may, on the one hand, imply flexibility and upward mobility, or on the other hand, an inability to maintain employment. Thus, for those holding two or less jobs, a positive impact on wages was anticipated, while the impact cannot now be predicted for those holding three or more jobs. Because of the small number of trainees who had had four or five jobs, they were grouped with

those holding three jobs. Thus the categories become one, two, and three or more jobs. The last category served as the base.

Employment Status Prior to Entering Training

Employment status prior to entering training should reflect an individual's employability.

Of those in the regression, this was the least perfectly measured variable of all. Reasons for this are: (1) a person may have left the armed services only a short time before entering training and had not sought a job, or (2) a person may have been unemployed because of strikes or temporary layoffs. Recognizing these drawbacks, the variable was included as a crude indicator of employability. The unemployed trainees served as the base for this variable.

Training Year

Training year was entered to allow for the possibility that TAT training may have been more effective in some years than in others. This variable was included in Models I and II.

Years Since Training

Years of experience count heavily in earnings. Promotions and seniority are achieved often only after years of employment with the same firm. Thus, years since training was entered as a proxy for experience, seniority, and promotions. This variable would also implicitly reflect training year differences. Years since training was entered as a variable in Models III and IV.

The effect of years since training may be curvilinear, with earnings increasing at a decreasing rate because of the combined

effects of experience and age. Thus, a squared term was entered for years since training.

Rural-Urban Background

In estimating the relationships between the above independent variables and hourly wage, comparisons between rural and urban trainees were a major objective. This rural-urban dichotomy was handled in the regression models in two ways:

1. By analyzing the rural and urban groups separately (Models I and III);
2. By incorporating a dummy variable for background (Models II, IV, and VI) in which rural trainees served as the base.

The separate analysis of the rural and urban groups permitted the regression coefficients (b values) of the rural and urban regressions to be compared. Entering background as a dummy variable in total group and training year equations permitted the impact of background on wages to be evaluated.

II. REGRESSION RESULTS

The regression results are presented in the order the models were previewed in Chapter I.

Two statistical tests were used to draw inferences about the relationships between the various independent variables and the dependent variable, hourly wage: the probability greater than F (P>F) test and the probability greater than absolute value of t(P>T) test. The P>F test was used to evaluate the significance

of the class variables relative to the dependent variable. The t test indicates the probability that there is a true difference in wage rate between a given dummy variable and the base variable in its class. The t test was used also to test the significance of each estimated b value--that is, to show the probability of there, indeed, being a relationship between a continuous independent variable and hourly wage. For the continuous variables the t and F tests are identical.

In the following discussion, the generalized dummy variables, i.e., sex, education, race, will be referred to as class variables while the specific dummy variable will be referred to by name, i.e., male, female, white, nonwhite, etc. The continuous variables will be referred to by name.

Model I

The results of Model I are shown for the total survey groups and the rural and urban trainees (Table XXIV).[1] In addition to the variables common to all models, training year is entered as a dummy variable. The regressions gave the following results:

Total group. Sex, employment at entry, training related job, number of jobs and training area were the significant class variables at the .10 level.

The significant b values were: male (.47), less than a high school education (-.30), employment at entry (.19), job training

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[1]In this and the following discussion, "significant" relationships refer to those having a probability of .10 or less or being different from 0 or the base value, as the case may be, according to the t or F test.

TABLE XXIV

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL I*

	Total			Rural			Urban		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Sex			.04[a]			.32			.19
Male	.47	.04[a]		.42	.32		.37	.19	
Female									
Training Area			.15			.09[b]			.37
Physical testing	-.32	.64		.83	.03[a]		-.54	.16	
Drafting	-.48	.16		.50	.26		-.58	.12	
Mechanical oper.	-.09	.80		.89	.02[a]		-.17	.65	
Machining	-.20	.54		.65	.05[a]		-.32	.63	
Welding	.09	.79		1.04	.006[a]		-.01	.97	
Electronics	-.27	.76					-.15	.69	
Chemical technology									
Education			.25			.012[a]			.61
Less than h.s.	-.30	.10[b]		-.80	.01[a]		-.11	.63	
High school	-.20	.17		-.76	.003[a]		.07	.70	
More than h.s.									
Race			.22			.65			.08[b]
White	.13	.22		.11	.65		.25	.08[b]	
Nonwhite									
Marital Status			.90			.61			.06[b]
Single	-.01	.90		-.08	.61		.07	.06[b]	
Married									

TABLE XXIV (continued)

	Total			Rural			Urban		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Employed at Entry			.05[a]			.60			.20
Employed	.19	.05[a]		.08	.60		.17	.20	
Unemployed									
Training Related Job			.0001[a]			.0001[a]			.05[a]
No	-.27	.09[b]		-.44	.10[b]		-.24	.22	
Yes	.27	.07[b]		.31	.20		.12	.52	
Some									
Number of Jobs			.0001[a]			.0001[a]			.0001[a]
1									
2	.99	.0001[a]		1.42	.0001[a]		.76	.0004[a]	
3 or more	.08	.64		.32	.18		-.02	.91	
Age	.06	.21	.21	.17	.01[a]		-.07	.64	
$(Age)^2$	-.001	.18	.18	-.003	.0093[a]		.001	.60	
Training Year			.0001[a]			.0001[a]			.0001[a]
1970	-.78	.0006[a]		-1.05	.0005[a]		-.91	.009[a]	
1969	-.19	.62		-.06	.82		-.54	.13	
1968	-.05	.79		-.28	.30		-.27	.55	
1967	-.39	.19		-.70	.07[b]		-.71	.14	
1966									

[a]Significant at .05 level; [b]Significant at .10 level.

*Model I:		Total	Rural	Urban
	Sample size	368	155	212
	d.f.	345	134	189
	R^2	.39	.58	.36
	Intercept	2.03	3.28	.87

related (.27), held one job (.99), and the 1970 training year (-.78).[2] In each case the sign was expected.

Rural trainees. The regression for rural trainees yielded the following significant class variables: training area, education, training related job,[3] number of jobs, and training year.

The b values which were significant were: physical testing (.83), drafting (.50), mechanical operations (.89), machining (.65), welding (1.04),[4] less than high school (-.80), high school (-.76), job not training related (-.44), held one job (1.42), 1970 training year (-1.05), and 1967 training year (-.70). Those variables, education and training related job, for which a sign related to the variable had been hypothesized were as expected.

Urban trainees. The significant class variables for the urban trainees were race, marital status, training related job, number of jobs, and training area. The continuous variables of age and age squared were also significant.

The significant b values were white (.25), not married (.07), held one job (.76), 1970 training year (-.91), age (.17) and age squared (-.003). The signs were as hypothesized.

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[2]The b coefficients are shown in parentheses in this and the following discussions.

[3]While training related job was significant as a class variable, neither of the dummy variables was significantly different from their base, implying that they were significantly different from one another.

[4]It must be kept in mind that the rural trainees' training area base is electronics, whereas for the total group and urban trainees it is chemical technology.

The comparison of the total group, rural and urban trainees, yields some interesting observations. While training area or education were not significant class variables for the total or urban groups, they were for the rural trainees.

Several reasons may be posited as to why these coefficients are significant for the rural trainees, but not for urban trainees or the total group. Regarding training area, the difference might be explained by the fact that the class variable had electronics as a base for the rural groups while the total and urban groups utilized chemical technology as the base. The resulting impact of training area on income for rural trainees was statistically mitigated when the rural group was combined with the urban group to analyze the total group.

Education was a significant class variable for rural trainees and the signs and coefficients indicate that the generalization that hourly wage is directly related to income is valid. Indeed, this generalization was borne out for all groups except urban trainees with a high school education. However, in only one of these cases (less than high school) was there statistical significance. The meaning of this is at best nebulous. On the one hand there is an indication that education does pay in later years, while on the other hand, there is evidence that education does not carry with it a later reward. Race was a significant variable for urban trainees, with whites making 25 cents more per hour than nonwhites, while it was not significant for rural trainees. This could be explained by the fact that only 8 percent of the rural trainees were nonwhite while 51 percent of the urban trainees were nonwhite.

The same reasoning may be used to explain the significance of marital status for urban trainees but not rural trainees (see Table III, page 26). The other contrast was the significance of age and age squared for rural trainees but not urban trainees.

Model II

The purpose of Model II was to provide a comparison with Model I to demonstrate how much variation in hourly wages was explained by adding a dummy variable for rural versus urban background rather than treating these groups separately. Thus, the model was run on the total group only (Table XXV). The impact of the rural-urban class variable may be evaluated by comparing the R^2 of Models I and II and by the significance of the new variable. The R^2 or amount of variation explained by the addition of the rural-urban variable was .03. Then, by the same token the P>T value was only .62, not at all significant. An examination of the b values shows little or no difference in the two tables and no variables were significant in Model II that are not already significant in Model I.

Model III

The only difference between Model I and Model III was that the class variable for training year was deleted and continuous variables for years since training and years since training squared were entered to allow for a change in productivity due to gained experience. The regressions were conducted on the total group and rural and urban trainees (Table XXVI). The results were as follows:

Total group. Sex, employment at entry, training related job,

TABLE XXV

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL II*

	Total		
	b	P>|t|	P>F
Sex			.03[a]
Male	.49	.03[a]	
Female			
Training Area			.13
Physical testing	-.32	.64	
Drafting	-.49	.15	
Mechanical operations	-.10	.79	
Machining	-.20	.55	
Welding	.09	.79	
Electronics	-.27	.55	
Chemical technology			
Education			.28
Less than high school	-.29	.12	
High school	-.18	.20	
More than high school			
Race			.13
White	.17	.13	
Nonwhite			
Marital Status			.94
Single	-.0008	.94	
Married			
Employment at Entry			.05[a]
Employed	.19	.05[a]	
Unemployed			
Training Related Job			.0001[a]
No	-.25	.11[a]	
Yes	.28	.06[a]	
Some			
Number of Jobs			.0001[a]
1	.99	.0001[a]	
2	.06	.69	
3 or more			
Age	.07	.20	
Age^2	-.001	.17	

TABLE XXV (continued)

	Total		
	b	P>|t|	P>F
Training Year			.0001[a]
1970	-.79	.0006[a]	
1969	-.19	.63	
1968	-.05	.25	
1967	-.39	.19	
1966			
Background			.62
Urban	.09	.62	
Rural			

[a]Significant at the .05 level.

		Total
*Model II:	Sample size	368
	d.f.	344
	R^2	.40
	Intercept	1.88

TABLE XXVI

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL III*

	Total			Rural			Urban		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Sex			.06[b]			.24			.25
Male	.43	.06[b]		.51	.24		.32	.25	
Female									
Training Area			.18			.22			.23
Physical testing	-.31	.89		.63	.11		-.56	.14	
Drafting	-.40	.24		.61	.18		-.60	.10[b]	
Mechanical oper.	-.03	.91		.86	.03[a]		-.14	.71	
Machining	-.15	.66		.62	.07[b]		-.29	.59	
Welding	.12	.72		.94	.02[a]		.01	.98	
Electronics	-.22	.54					-.13	.74	
Chemical technology									
Education			.57			.10[b]			.62
Less than h.s.	-.23	.20		-.49	.11		-.10	.68	
High school	-.15	.29		-.54	.03[a]		.08	.66	
More than h.s.									
Race			.30			.92			.10[b]
White	.11	.30		.03	.92		.23	.10[b]	
Nonwhite									
Marital Status			.77			.62			.81
Single	-.03	.77		-.08	.62		.04	.81	
Married									

TABLE XXVI (continued)

	Total			Rural			Urban		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Employment at Entry			.06[b]			.66			.16
Employed	.18	.06[b]		.15	.66		.19	.16	
Unemployed									
Training Related Job			.0001[a]			.0001[a]			.05[a]
No	-.26	.10		-.27	.66		-.24	.24	
Yes	.29	.05[a]		.54	.05[a]		.13	.52	
Some									
Number of Jobs			.0001[a]			.0001[a]			.0001[a]
1	.95	.0001[a]		1.26	.0001[a]		.75	.0005[a]	
2	.02	.86		.60	.60		-.05	.80	
3 or more									
Age	.05	.28		.17	.01[a]		-.07	.30	
Age^2	-.001	.24		-.003	.01[a]		.001	.68	
Years Since Training	.96	.0003[a]		1.02	.0006[a]		.61	.07[b]	
(Yrs. since train.)^2	-.10	.003[a]		-.10	.02[a]		-.05	.27	

[a]Significant at the .05 level; [b]Significant at the .10 level.

*Model III:	Total	Rural	Urban
Sample size	368	155	212
d.f.	347	136	189
R^2	.39	.52	.35
Intercept	-.33	.74	-.86

and number of jobs were the significant class variables. Years since training and years since training squared were the significant continuous variables.

The significant b values were male (.43), employed at entry to training (.18), job not training related (-.26), job training related (.29), held one job (.95), years since training (.96), and years since training squared (-.10). In each case the signs were as expected.

Rural trainees. The significant class variables for rural trainees were high school education, training related job, and number of jobs. The significant continuous variables were years since training and years since training squared.

The b values which were significant were mechanical operations (.86), machining (.62), welding (.94), high school (-.54), job training related (.54), held one job (1.26), years since training (1.02), and years since training squared (-.10).

Urban trainees. Race, training related job,[5] and number of jobs were the significant class variables. The significant continuous variables were age, age squared and years since training. The b values of the significant variables were drafting (-.60), race (.23), held one job (.75), age (.17), age squared (.003), and years since training (.51).

When comparing the three equations used in Model III, the following points are of interest. Several training areas are

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[5]While training related job was a significant variable, neither of the dummy variables was significantly different from its base. This implies that they were significantly different from each other.

statistically significant yet the class variable, training area, is never significant. Also, education is a significant class variable for rural trainees but not for urban trainees, while the opposite is true of the class variable, race. Years since training squared was significant for the total group and rural trainees but not for urban trainees. This again might reflect the greater upward mobility which whites enjoy over nonwhites.

Model IV

Model IV was identical to Model III except the distinction between rural and urban backgrounds was entered into a single regression equation (Table XXVII). The most straightforward form of analysis here is a comparison of R^2 values and level of significance of the b coefficients. The R^2 values were unchanged while the P>F for the class variable, rural-urban, was significant. Also b values were practically unchanged, and none is significant in one model that is not significant in the other.

Model V

Model V was identical to Models I and III in that it excluded the rural-urban class variable and it also excluded any variable relating to training year, either class or continuous (Tables XXVIII and XXIX). The model was run on the total group and for training years 1968, 1969, and 1970. Thus, of the six models, this one included the fewest independent variables. The results are as follows:

Total group. The significant class variables were sex, training area, employed at entry, training related job, and number

TABLE XXVII

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL IV*

	Total		
	b	P>|t|	P>F
Sex			.03[a]
Male	.45	.05[a]	
Female			
Training Area			.16
Physical testing	-.31	.63	
Drafting	-.41	.22	
Mechanical operations	-.04	.90	
Machining	-.14	.67	
Welding	.12	.72	
Electronics	-.22	.53	
Chemical Technology			
Education			.53
Less than high school	-.22	.22	
High school	-.14	.66	
More than high school			
Race			.18
White	.16	.18	
Nonwhite			
Marital Status			.80
Single	-.03	.80	
Married			
Employed at Entry			.05[a]
Employed	.19	.05[a]	
Unemployed			
Training Related Job			.001[a]
No	-.24	.13	
Yes	.30	.04[a]	
Some			
Number of Jobs			.0001[a]
1	.01	.90[b]	.0001[a]
2			
Age	.05	.26	
Age^2	-.001	.22	.22
Years Since Training	.97	.0002[a]	.0002[a]
Years since training^2	-.10	.002[a]	.002[a]
Background			.88
Urban		.15	.88
Rural			

[a]Significant at the .05 level; [b]Significant at the .10 level.

		Total
*Model IV:	Sample size	368
	d.f.	346
	R^2	.39
	Intercept	-.32

TABLE XXVIII

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL V*

	1970			1969			1968		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Sex			.96			.13			.03[a]
Male	.02	.96		.65	.13		1.24	.03[a]	
Female									
Training Area			.11			.16			.20
Physical testing	-.56	.19		1.05	.12		.19	.67	
Drafting	-.66	.13		.73	.29		-.63	.13	
Mechanical oper.	-.69	.10[b]		1.10	.11		.22	.51	
Machining	-.39	.29		.99	.16		.25	.55	
Welding	.35	.54		1.52	.03[a]				
Electronics	-.10	.79							
Chemical technology									
Education			.28			.24			.84
Less than h.s.	-.35	.27		-.45	.18		-.20	.56	
High school	.08	.73		-.55	.09[b]		-.13	.67	
More than h.s.									
Race			.16			.02[a]			.14
White	-.28	.16		.41	.02[a]		.23	.14	
Nonwhite									
Marital Status			.87			.59			.31
Single	.03	.87		-.18	.59		.21	.31	
Married									

TABLE XXVIII (continued)

	1970			1969			1968		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Employment at Entry			.67			.62			.08[b]
Employed	-.70	.67		.17	.62		.30	.08[b]	
Unemployed									
Training Related Job			.12			.004[a]			.001[a]
No	-.37	.16		.18	.61		-.85	.001[a]	
Yes	-.0001	.99		.81	.02[a]		-.26	.30	
Some									
Number of Jobs			.26			.0001[a]			.0001[a]
1	.01	.96		1.29	.001[a]		1.81	.0001[a]	
2	-.42	.17		.10	.72		.58	.04	
3 or more									
Age	.05	.71	.71	.008	.95	.95	.002	.98	.98
Age^2	-.0001	.94	.94	.0006	.79	.79	.00004	.97	.97

[a]Significant at the .05 level; [b]Significant at the .10 level.

*Model V:	1970	1969	1968
Sample size	121	107	99
d.f.	102	90	82
R^2	.26	.48	.66
Intercept	2.7	.93	.68

TABLE XXIX

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL V*, TOTAL

	Total		
	b	P>|t|	P>F
Sex			.01[b]
Male	.60	.01[b]	
Female			
Training Area			.05[a]
Physical testing	.17	.63	
Drafting	.05	.88	
Mechanical operations	.50	.14	
Machining	.24	.53	
Welding	.63	.07[b]	
Electronics	.15	.68	
Chemical technology			
Education			.56
Less than high school	-.21	.24	
High school	-.18	.23	
More than high school			
Race			.24
White	.13	.24	
Nonwhite			
Marital Status			.64
Single	.06	.64	
Married			
Employed at Entry			.05[a]
Employed	.21	.05[a]	
Unemployed			
Training Related Job			.0001[a]
No	-.39	.02[a]	
Yes	.35	.02[a]	
Some			
Number of Jobs			.0003[a]
1	.94	.05[a]	
2	.11	.50	
3 or more			
Age	.05	.26	.26
Age^2	-.001	.68	.68

[a]Significant at the .05 level; [b]Significant at the .10 level.

		Total
*Model V:	Sample size	368
	d.f.	350
	R^2	.33
	Intercept	.98

of jobs. No continuous variables were significant. The significant b variables were male (.60), welding (.63), employed at entry to training (.21), job not training related (-.32), job training related (.35) and held one job (.94). The signs were all as anticipated.

1968. Significant class variables were sex, training related job, employment at entry to training, and number of jobs. No continuous variables were significant.

The b values of the significant variables were male (1.24), employed at entry (.30), job not training related (-.85), held one job (1.81), held two jobs (.58). The signs were as hypothesized.

1969. Race, training related job, and number of jobs were the only significant class variables in this equation.

The b values of the significant variables were white (.41), training related job (.81), and held one job (1.29).

1970. For this training group the most interesting point is that there were no statistically significant variables, although training area (.11) and training related job (.12) were almost significant. The postulated reason for this is that the trainees had not been in the labor force long enough for these factors to affect their wages significantly.

The interyear results reveal some divergencies from the total-group picture. The 1970 group is, of course, different, for there were no significant variables. However, the two variables which did approach significance would have coincided with significant variables in the total group. Another divergency was the significance of race in the 1969 group but not in the other groupings of trainees. For

this group, sex and wages were not significantly related. Although sex by race was not known, this may imply that in 1968 a majority of the nonwhite trainees were females.

Model VI

This model was the same as Model V except that rural-urban background was entered into the equation as a dummy variable (Tables XXX and XXXI). Again the analysis takes the form of comparing R^2's and the significance of the rural-urban class variable. The R^2 of 1968, 1969, and 1970 were increased by .04, .01, and .01, respectively, as compared with the results of Model V. The R^2 for the total group was unchanged. In the training year equations the rural-urban dichotomy was statistically significant but the signs of the coefficients were puzzling. The b values were 1968 (.28), 1969 (-.36) and 1970 (.46). While rural trainees had higher average wages overall, the effect of being a rural trainee in 1968 and 1970 was to reduce wages by 28 cents and 46 cents, respectively.

III. INTERMODEL COMPARISONS

The models were developed in such a way that by comparing models the impact of rural and urban background can be evaluated (Table XXXII). Models I, III, and V were each calculated excluding background as a variable, while Models II, IV, and VI all included it. Thus, by comparing R^2's, the degree of relationship between background and wages can be estimated. That is, to what extent does background help to explain hourly wage? Also, cross-model comparisons of the b values and their signs can be made.

TABLE XXX

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL VI*, TOTAL

	Total		
	b	P>|t|	P>F
Sex			.01[a]
Male	.61	.01[a]	
Female			
Training Area			.05[a]
Physical testing	.18	.63	
Drafting	.05	.88	
Mechanical operations	.50	.14	
Machining	.25	.54	
Welding	.64	.07[b]	
Electronics	.15	.68	
Chemical technology			
Education			.55
Less than high school	-.21	.25	
High school	-.17	.24	
More than high school			
Race			.26
White	.14	.26	
Nonwhite			
Marital Status			.63
Single	.06	.63	
Married		1.00	
Employed at Entry			.05[a]
Employed	.21	.05[a]	
Unemployed			
Training Related Job			.0001[a]
No	-.38	.02[a]	
Yes	.35	.02[a]	
Some			
Number of Jobs			.0001[a]
1	.94	.0001[a]	
2	.11	.51	
3 or more			
Age	.06	.26	.26
Age^2	-.001	.32	.32
Background			.88
Urban	1.50	.88	
Rural			

[a]Significant at the .05 level; [b]Significant at the .10 level.

		Total
*Model VI:	Sample size	368
	d.f.	349
	R^2	.33
	Intercept	.95

TABLE XXXI

REGRESSION RELATIONSHIPS BETWEEN HOURLY WAGE AND TRAINEE CHARACTERISTICS, TAT GRADUATES SURVEYED, 1972, MODEL VI*, 1968-1970

	1970			1969			1968		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Sex			.85			.19			.01[a]
Male	-.06	.85		.57	.19		1.43	.01[a]	
Female									
Training Area			.03[a]			.18			.25
Physical testing	-.68	.11[b]		1.05	.12		.34	.57	
Drafting	-.80	.06[b]		.76	.26		-.49	.24	
Mechanical oper.	-.70	.09[b]		1.06	.17		.26	.57	
Machining	-.38	.29		.84	.20[a]		.28	.63	
Welding	.49	.28		1.46	.04[a]		.09	.78	
Electronics	-.07	.85							
Chemical technology									
Education			.28			.21			.95
Less than h.s.	-.32			-.47	.18[b]		-.11	.76	
High school	.10			-.57	.07[b]		-.07	.82	
More than h.s.									
Race			.82			.16			.04[a]
White	-.05	.82		.28	.16		.38	.04[a]	
Nonwhite									
Marital Status			.71			.59			.22
Single	.07	.71		-.18	.59		.25	.22	
Married									

TABLE XXXI (continued)

	1970			1969			1968		
	b	P>|t|	P>F	b	P>|t|	P>F	b	P>|t|	P>F
Employment at Entry			.74			.55			.09[b]
Employed	-.06	.74		.12	.55		.28	.09[b]	
Unemployed									
Training Related Job			.14			.0025[a]			.001[a]
No	-.33	.20		.08	.83		-.82	.001[a]	
Yes	.01	.95		.76	.03[a]		.21	.61	
Some									
Number of Jobs			.23			.0001[a]			.0001[a]
1	.02	.92		1.29	.001[a]		1.80	.0001[a]	
2	-.41	.18		.15	.59		.56	.045[a]	
3 or more									
Background			.02[a]			.09[b]			.09[b]
Urban	.46	.02[a]		-.36	.09[b]		.28	.09[b]	
Rural									
Age	.09	.56	.56	.01	.93	.93	.01	.88	.88
Age^2	-.001	.73	.73	-.001	.74	.74	-.0006	.95	.95

[a]Significant at the .05 level; [b]Significant at the .10 level.

*Model VI:	1970	1969	1968
Sample size	121	107	99
d.f.	101	89	81
R^2	.30	.49	.67
Intercept	1.54	.33	.44

TABLE XXXII

SUMMARY OF REGRESSION RELATIONSHIPS BETWEEN WAGE AND TRAINEE CHARACTERISTICS SHOWING R^2 AND SIGNIFICANT b VALUES ONLY, TAT GRADUATES SURVEYED, 1972

	Model I			Model II	Model III			Model IV	Model V				Model VI			
	Total	Rural	Urban	Total	Total	Rural	Urban	Total	Total	1970	1969	1968	Total	1970	1969	1968
R^2	.39	.57	.36	.40	.39	.52	.35	.39	.33	.26	.48	.66	.33	.30	.49	.67
Regression Coefficients																
Sex																
Male	.47			.49	.43			.45	.60			1.24	.61			1.43
Training Area																
Phys. test.		.83												-.80		
Drafting		.50					-.60							-.70		
Mechanical oper.		.89				.86				-.69						
Machining		.65				.62										
Welding		1.04				.94			.63				.64		1.46	
Electronics																
Education																
Less than h.s.	-.30	-.80														
High school		-.76				-.54					-.55				-.57	
Race																
White		.25					.23				.41					.38
Marital Status																
Single		.07														
Employed at Entry																
Employed	.19			.19	.18			.19	.21			.30	.21			.28

TABLE XXXII (continued)

	Model I			Model II	Model III			Model IV	Model V				Model VI			
	Total	Rural	Urban	Total	Total	Rural	Urban	Total	Total	1970	1969	1968	Total	1970	1969	1968
Training Related Job																
No	-.27	-.44	-.24*		-.26		-.24*		-.39			-.85	-.38			-.82
Yes	.27		.12*	.28	.29	.54	.13*	.30	.35		.81		.35		.76	
Number of Jobs																
1	.99	1.42	.76	.99	.95	1.26	.75	.01	.94		1.29	1.81	.94		1.29	1.80
2																.56
Age		.17				.17										
Age^2		-.003														
Background	a	a	a		a	a	a		a	a	a	a				
Urban	a	a	a		a	a	a		a	a	a	a		.46	-.36	.28
Years Since Training	a	a	a	a	.96	1.02	.61	.97	a	a	a	a	a	a	a	a
Yrs. since $train.^2$	a	a	a	a	-.10	-.10		-.10	a	a	a	a	a	a	a	a
Training Year					a	a	a	a	a	a	a	a	a	a	a	a
1970	-.78	-1.05	-.91	-.79	a	a	a	a	a	a	a	a	a	a	a	a
1969					a	a	a	a	a	a	a	a	a	a	a	a
1968					a	a	a	a	a	a	a	a	a	a	a	a
1967		.70			a	a	a	a	a	a	a	a	a	a	a	a

*Class variables were significant but dummies were not implying that they were significantly different from one another and not their base.

[a]Variable was not included in the equation.

R^2

The rural trainees in Models I and II yielded higher R^2's than the urban trainees. This implies a closer relationship between wages and the independent variables among rural trainees than the total or urban groups. The small increase in R^2 from Model I to Model II indicates that the addition of a variable for background adds little to the explanatory value of the model. When Model I with training year entered as a dummy variable is compared with Model III, where number of years since training and its squared term were entered as continuous variables, the R^2 is greater for rural and urban trainees but only by .05 and .01, respectively. Model V gave no consideration to training year either as a continuous or dummy variable. So the R^2 for the total group of Model V can be compared to the total group R^2 from Model I and Model III. This indicates that adding a dummy variable for training year increased the percentage of explained variation in wages by .06 and years since training increased the explained variation by .06. Model V also contained equations for training year and the R^2's ranged from a low of .26 in 1970 to a high of .66 in 1968. The range of R^2's can be explained in part by the fact that fewer variables were significant for the 1970 group than the 1968 group. By adding the variable for background, the total-group R^2 in Model VI is unchanged. While R^2's for individual training years are increased, it is not by a noticeable amount.

Regression Coefficients

Being a male had significantly positive effects on wages in all of the total-group analyses. But when the data were disaggregated

into training year or background, sex had a significant impact on wages only for the 1968 group in Models V and VI. One explanation for the lack of significance of sex as a variable is that the disaggregation of the data into training year or background groups makes the number of women in any one group too few for tests of significance to bring out wage differences.

No pattern was found for the significance of the training area variables. A high school education was significant and had a negative sign for rural trainees and the 1969 training year. When considered alone this appears nonsensical. However, if data beyond the summary are considered (i.e., the nonsignificant b values for education), there is a rational pattern. The less-than-high-school variable has the larger negative b coefficient in all cases while the smaller negative b coefficients were found for the high school variable. This implies a direct relationship between wages and education. Being white contributed positively to the incomes of urban trainees but showed no consistent contribution in the interyear comparisons. Being employed at entry always contributed positively to income in all total group equations, but only in one of the training year equations--1968. Disaggregation of the data into training years apparently kept this variable from being statistically significant within the other groups.

Having a job that is not related to training significantly reduced wages in nine equations, while having a job which was related to training significantly increased income in eleven equations. The 1970 equations were the only ones in which income was not affected by the training related nature of the job. This is important for,

if it can be assumed that 1970 trainees have not been employed long enough to have developed and taken advantage of their skills, one may conclude that employers are not using the TAT program as a screening device for potential employees but the skill training is of value in itself.

Job mobility may or may not be an asset to a trainee. The regressions indicated in all but the 1970 equations that trainees who held only one job earned significantly more than their more mobile counterparts. The reason postulated for the absence of significance in the 1970 training year is that these trainees did not have time to make many job changes.

Rural and urban background was entered as a variable in Model VI. Having an urban background had a significant positive impact on hourly wage in 1968 and 1970, but a rural background contributed positively to wages for those trained in 1969. All training groups taken together, wage differences between rural and urban trainees were not significant. So in the total group aggregation of the data averaged out the impact of background on wages.

Years since training and its squared term were entered into Models III and IV. Both were significant in the total and rural groups, and years since training was significant in the urban group. The positive regression coefficients for the years since training indicate that, as a worker has time to develop his skills, gain seniority and earn promotions, his earnings do indeed increase. By the same token, the minus signs associated with the coefficients for the squared term indicate that earnings will increase at a decreasing rate as a trainee moves through time.

The last variable to be considered in this section is training year, which was entered as a dummy variable in Models I and II. The 1970 trainees made significantly less than the base years (1966) trainees in all cases. This may be explained by the short period of time that the trainees have been employed. They had not yet had time to reach the higher pay grades often earned by skill development and promotions. The 1967 trainees also earned significantly less but, as noted in Chapter II, this could be a result of a sampling error.

CHAPTER IV

SUMMARY AND IMPLICATIONS

The main intent of this study was to examine contrasts and similarities between rural and urban trainees in the Training and Technology program at Oak Ridge, Tennessee. Data from a 1972 follow-up survey of former TAT trainees were the sources of information. The analysis consisted of two components: (1) tabular profiles of the trainees, emphasizing personal, mobility, and work related characteristics, and (2) multiple regression analysis to determine the impact of background on hourly wages while holding the impact of other variables constant.

It should be noted again that the rural trainees were more homogenous as a group than their urban counterparts. Rural trainees came primarily from the rural areas and small localities in Appalachia. On the other hand, urban trainees came from places as diverse as Kingston, Tennessee, and Chicago, Illinois.

I. KEY FINDINGS

The profiles based on TAT survey data established that there were 173 rural and 236 urban trainees in the sample. The average wage for rural trainees was $3.49 compared with $3.29 for the urban trainees. However, when other background characteristics which might affect wages were considered, this difference in wages was mitigated. For one thing, there was considerable variation among the wages of trainees in different training years, and trainees with

rural backgrounds tended to be concentrated in the earliest years. So the wage difference could be the result of years in the work force rather than background.

The findings of the regression analysis did not show any marked relationship between wages and background. In three of the six equations, in which background was entered as a dummy variable, rural-urban wage differences were not statistically significant. Results among training years were not consistent; in some training groups graduates of rural origin earned more, whereas in other groups those from urban origins had higher wages. Thus it cannot be conclusively stated that one group did better or worse than the other.

How did rural and urban trainees compare in education, race and marital status, and what were impacts of these variables?

A larger percent of the rural trainees had high school educations than did urban trainees. The regressions showed rural trainees with high school educations to be earning less than rural trainees with some college. Rural trainees with less than high school education, however, did not consistently earn less than those with post-high school training. On the other hand, there was no particular association between wages and educational level among urban trainees.

Thirty-five percent of the survey was nonwhite, most of whom came from urban backgrounds. The earnings of the nonwhite urban trainees were significantly less than white urban trainees to the extent of 25 cents per hour, when other variables were held constant.

Eight percent fewer rural trainees than urban trainees were married. In general, marital status was not related to wages.

To be employed at entry into training showed a positive effect on trainees' wages when they were taken as a group. But when the trainees were separated by background, the relationship was not clear.

What appeared to be the major factors affecting wages?

Of great importance was whether a trainee held a training related job. Sixty percent of the rural trainees and 53 percent of the urban trainees did hold training related jobs, while 33 percent of each group held jobs that were not training related. The remainder had jobs which they described as being somewhat training related. Having a job directly related to training added a minimum of 12 cents and a maximum of 81 cents to hourly wage.

Another consideration which was significantly associated with wage was the number of jobs which a trainee had held after completing the TAT program--the fewer the jobs, the higher the wages. Rural and urban trainees were quite similar in this respect, with 61 percent of the former and 63 percent of the latter having held only one job. The least that staying on one job added was 75 cents, while in one comparison it added $1.81 per hour. So one conclusion to be drawn from this study was that, for this sample, job mobility had not resulted in higher wages. Instead, it may reflect instability, inadequate skills, or poor work attitudes.

II. IMPLICATIONS FOR FUTURE TRAINING PROGRAMS

The results of this analysis carry several implications for future manpower training programs.

First, that those trainees with less than a high school education did as well as they did implies that training with this level of

education did gain considerably from their training. Therefore, it may be inferred that a particular minimum educational level is not necessary for effective utilization of training programs like TAT. However, further research is needed in this area, as is noted below.

Second, age had very little impact on wages. So, little emphasis need be put on recruiting a given age bracket from the standpoint of the wage which a potential trainee would earn. There are other considerations, social and political, which may overrule this, however.

Third, if a potential trainee has been employed just prior to training, these results indicate that he will fare better after training than his counterparts who were unemployed when beginning this training. This does not necessarily mean that recruiting should be concentrated among the employed, for one goal of many manpower programs is to train the hardcore unemployed. What this does imply is that those ideas, attitudes, and related attributes which contribute to people being employed need to be identified, analyzed and put in a form which can be taught to the trainee who was unemployed when training commenced.

Fourth, as far as possible, trainees should be encouraged to find training related jobs and stay with them. This is not to rule out the desirability of seeking a better job than the first job taken. But it does imply that the characteristics which make an employer keep the employee are those which contribute to an employee earning higher wages. Thus, these characteristics should be instilled in trainees while in training.

III. SUGGESTIONS FOR FURTHER RESEARCH

For a complete analysis of the TAT program and its effects, more information is needed than was available from the survey used in this study, and there are other aspects of the post-training experience besides earnings that can usefully be analyzed.

First, in order to evaluate the effectiveness of any training program an estimate is needed of how the participants would have fared had they not undergone training. One approach would be to use a control group of nontrainees with characteristics similar as possible to the program's trainees. This would enable a comparison of earnings and an estimate of net benefits to trainees of training.

A follow-up study of TAT dropouts would be beneficial. It would highlight shortcomings and problems in the program not brought out in a survey of graduates only.

Further, information about the trainees who went through the program in 1966 and 1967 is needed. These trainees are unique in that they provide an opportunity to view the results of the program from a distant point in time. But again, a control group would be necessary for complete evaluation of training program impacts.

The survey indicated that 10 percent of the sample was unemployed. This unemployment rate was greater than the unemployment rate for the nation at the time of the survey. A study of the employment status of all TAT graduates, followed by an analysis of the causes of unemployment among TAT graduates, would be informative. Then, where possible, preventive measures could be implemented for future trainees.

Within the data presently available, comparative analysis of trainees who have and have not moved would be enlightening. It would enable counselors to advise trainees preparing to leave the program on the benefits of moving or remaining where they are. This advice would also be enhanced by a comparative analysis of the major labor markets in which trainees presently work.

BIBLIOGRAPHY

BIBLIOGRAPHY

Arensberg, Conrad M., Solomon Barkin, W. Ellison Chalmers, Harold L. Wilensky, and James C. Worthy, *Research in Industrial Human Relations* (New York: Harper and Brothers, 1957).

Bateman, Worth, "An Application of Cost Benefit Analysis to the Work Experience Program," *American Economic Review*, LVII (1972).

Belante, Donald M., "Effects of General Education in Manpower Programs," *The Journal of Human Resources*, VII (Spring 1972).

Borus, Michael, "The Effects of Retraining the Unemployed in Connecticut," in *Retraining the Unemployed*, ed. Gerald Somers (Madison: University of Wisconsin Press, 1968).

Borus, Michael, John Brennen, and Sydney Rosen, "A Benefit Cost Analysis: The Neighborhood Youth Corps--The Out of School Program in Indiana," *Journal of Human Resources*, V (Spring 1971).

Borus, Michael, and William R. Tash, *Measuring the Impact of Manpower Programs: A Primer* (Policy papers in human resources and industrial relations). Institute of Labor and Industrial Relations, Institute of Labor and Industrial Relations, University of Michigan--Wayne State University, 1970.

Cain, Glen and Ernst Stromsderfer, "An Economic Evaluation of Government Retraining Programs in West Virginia," in *Retraining the Unemployed*, ed. Gerald Somers (Madison: University of Wisconsin Press, 1968).

Colbert, John, and Marcia Hohn, *Guide to Manpower Training* (New York: Behavioral Publications, Inc., 1970).

Dymond, William, "The Role of Benefit/Cost Analysis in Formulating Manpower Policy," in *North American Conference on Cost Benefit Analysis of Manpower Policies* (Kingston, Ontario: Industrial Relations Centre, Queens University, 1969).

Garms, Walter I., "Benefit Cost Analysis of the Upward Bound Program," *The Journal of Human Resources*, V (Spring 1971).

Hardin, Einar, and Michael Borus, *Economic Benefits and Costs of Retraining Courses in Michigan*, Manpower Administration, U.S. Department of Labor (East Lansing, Michigan: School of Labor and Industrial Relations, Michigan State University, 1969).

Hardin, Einar, "Benefit-Cost Analysis of Occupational Training Programs: A Comparison of Recent Studies," in *North American Conference on Cost Benefit Analysis of Manpower Policies* (Kingston, Ontario: Industrial Relations Centre, Queens University, 1969).

Hu, Teh-Wei, Nan Lin Lee, Ernst Stromsderfer, "Economic Returning to Vocational and Comprehensive High School Graduates," *Journal of Human Resources*, VI (Winter 1971).

Main, W., "A Nationwide Evaluation of M.D.T.A. Institutional Job Training," *Journal of Human Resources*, VI (1971).

Mestre, Elroy R., *Economic Minorities in Manpower Development* (Lexington, Mass.: Heath and Company, 1971).

Myers, Charles A., and Fredrick Harris Harbison, eds., *Manpower and Economic Development: Country Studies in Economic Development* (New York: McGraw-Hill, 1965).

Palomba, Neil A., and Edward B. Jakubauskas, *Creativity and Innovation in Manpower Research and Action Programs* (Ames, Iowa: Industrial Relations Center, Iowa State University, 1971).

Roe, Anne, *Psychology of Occupations* (New York: John Wiley and Sons, 1946).

Solie, Richard, "An Evaluation of the Effects of Retraining in Tennessee," in *Retraining the Unemployed*, ed. Gerald Somers (Madison: University of Wisconsin Press, 1968).

Snyder, Richard J., *Manpower Planning: A Resource Bibliography* (Minneapolis: University of Minnesota Press, 1967).

Somers, Gerald, and J. Kenneth Little, eds., *Vocational Education: Today and Tomorrow*, Center for Studies in Vocational and Technical Education (Madison: University of Wisconsin Press, 1971).

Stromsderfer, Ernst, "Determinants of Economic Success in Retraining the Unemployed: The West Virginia Experience," *Journal of Human Resources*, III (1968).

Training and Technology: An Industrial/Education Partnership for Industrial Manpower Development, Training and Technology, Manpower Development Division (Oak Ridge, Tennessee: Oak Ridge Associated Universities, 1972).

Weisbrod,Burton, "Benefits of Manpower Programs: Theoretical and Methodological Issues," in *North American Conference on Cost Benefit Analysis of Manpower Policies* (Kingston, Ontario: Industrial Relations Centre, Queens University, 1969).

Weisbrod, Burton, ed., *The Economics of Poverty: An American Paradox* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965).

Weisbrod, Burton, and W. Lee Hansen, *Benefits, Costs and Finance of Public Higher Education* (Chicago: Markham Publishing Company, 1969).

Weisbrod, Burton, *Spillover of Public Education Costs and Benefits* (St. Louis: Washington University, 1963).

Wood, W. Donald and Harry F. Campbell, *Cost Benefit Analysis and the Economics of Investment in Human Resources (An Annotated Bibliography* (Kingston, Ontario: Industrial Relations Centre, Queens University, 1970).

APPENDIX

TAT QUESTIONNAIRE

Interviewer _____ Date _____

1. Name _____
(Last) (First) (Middle)

2. Social Security No. _____ 3. Phone _____

4. Home Address _____
(#) (Street) (Apt. #)

_____
(City) (State) (Zip Code)

JOB RECORD

5. Date Graduation _____
(Month) (Year)

6. Area Training _____

_____

_____

00=glass blowing
01=physical testing
02=drafting
03=mechanical operations
04=machining
05=welding
06=electrician
07=chemical technicial
08=process operations
09=electro mechanics

7. How many jobs have you had since graduating from TAT? _____

8. Are you currently employed? Yes _____ No _____

PERSONAL AND COMMUNITY DATA

1. Marital Status: Single ___ Married ___ Divorced ___
Separated ___ Widowed ___

2. No. of dependents _____ 3. No. of children _____

4. Residential Information (start with first residence after graduation)

City & State Zip Only	Type Residence	Rent or Own	No. People in Residence	Date Arrived

(1=House; 2=Apartment; 3=Trailer; 4=Parents; 5=Room; 6=Other)

(1) _____

(2) _____

(3) _____

(4) _____

(5) _____

(6) _____

5. Do you plan to move in the foreseeable future? __ Yes __ No

   Reason: __ Family desires __ Job in field
   __ Closer to relatives __ Higher level job
   __ Higher paying job __ Better residence
   __ Nicer neighborhood __ Other (specify) _____

   _____

6. Did your first job require that you move to a new location?

   __ Yes __ No

7. Did you want to make this move? __ Yes __ No

8. Did your family want to make this move? __ Yes __ No __ Don't know

9. Were you familiar with the new location? __ Yes __ No

   Your family? __ Yes __ No

10. Did any subsequent jobs require that you move? __ Yes __ No

11. How many jobs have required moving since graduation? _____

12. Did any of these subsequent moves cause difficulties for you?

    __ Yes __ No Your family? __ Yes __ No

13.

Severity (code #)	Began (mo/yr)	Ended (duration)	Rank (code #)

4=finding suitable housing
5=relocation costs
6=strangeness of new community; homesickness
7=finding a desirable job
8=transportation to job

14a. Did you own a car when you graduated? __ Yes __ No

14b. How did you get to work on your first job? __ bought car & drove;

__ bus; __ walk; __ drove own car; __ carpool; __ subway or "L";

__ other

15a. Do you now own a car? __ Yes __ No

15b. How do you get to work? __ drive self; __ walk; __ carpool;

__ subway or "L"; __ other

16. Have you had problems getting to work? __ Yes __ No

What was the cause? _____

4=problems with public transportation
5=problems with car pool
6=expensive, unexpected car repairs

How did you solve it? _____

7=had to buy car
8=had to quit job

Was it a __ very severe; __ annoying; __ minor problem?

17a. Do you have a checking account? __ Yes __ No

17b. How long have you had it?

17c. What problems have you had with it?

4=balancing checkbook--"bounced checks"
5=mix-ups by business firms

17d. Were these problems __ severe; __ annoying; __ minor?

18a. Do you have a savings account? __ Yes __ No

18b. How long? _____

19a. Do you have any credit cards or charge accounts? __ Yes __ No

How many?

19b. Have you had any problems with credit cards or charge accounts?

What were they? _____

4=charged too much--couldn't pay bills
5=not specified
6=hard to establish credit in new city
7=billing mix-up; red tape

19c. Were these problems __ severe; __ annoying; __ minor?

20a. Do you have life insurance? __ Yes __ No

Is it __ group or __ personal?

20b. Do you have car insurance? __ Yes __ No

Is it __ group or __ personal?

20c. Do you have health insurance? __ Yes __ No

Is it __ group or __ personal?

20d. Is your health insurance __ disability income; __ hospitalization;

__ major medical; __ sickness & accident; __ other

20e. List below problems with your insurance

Severity (code #)	Began (mo/yr)	Ended (duration)	Rank (code #)

5=insurance company not paying as much as promised
6=trouble choosing policy
7=expensive rates

21a.

Problem	Severity (code #)	Began (mo/yr)	Ended (duration)	Rank (code #)

0=none
1=periods of no income; strikes, layoffs, unemployed
2=low salary; couldn't maintain budget
3=survival money between jobs
4=expensive relocation costs
5=car payments--insurance payments
6=transportation money for commuting
7=tools for job expensive
8=high housing costs
9=hospital bills

21b.

Problem	Severity (code #)	Began (mo/yr)	Ended (duration)	Rank (code #)

1=periods of no income; strikes, layoffs, unemployed
2=low salary; couldn't maintain budget
4=expensive relocation costs
5=car and/or insurance payments
8=high housing costs
9=medical costs

22. What community assistance agencies have you had contact with since graduation? _____
For what purpose? _____
For how long? _____ (After obtaining list have subject rank agencies, with rank 1 assigned to most important.)
(Probe items--welfare organizations, YMCA, day-care centers, employment services, Red Cross, police.)

Name	Purpose	Began	Ended	Rank

Name
1=employment service
2=manpower training (Job Corps, CEP, etc.)
3=welfare organizations
4=assistance type organizations (Red Cross, Day Care Centers)
5=Police
6=other

Purpose
1=training
2=financial aid
3=job placement
4= services
5=other

23. Name the organizations to which you belong: _____; how often you attend meetings (%) and any offices held in each (Place a rank of 1 by the one which the graduate feels is most important to him, etc.)

Name	% Attendance	Offices Held	Rank

Name
001=church or religious
002=lodge, club, fraternity
003=company sponsored team or club
004=individual team or club
005=any civic type organization
006=hobby club
007=other
008=any union activities

Office
1=president or captain
2=vice-president
3=secretary-treasurer
4=other

24. Many people who get training and jobs have problems with their friends and family. What problems have you encountered? With whom? For what period and how severe was it?
(1=very severe; 2=annoying; 3=minor)

Problem	Relationship	Began	Ended	Severity	Rank

(Rank with 1 for worst problem, etc.)

Problem	Relationship
1=shiftwork; hours	1=parents
2=relocation	2=siblings
3=homesickness, missing people	3=spouse
4=other	4=children
	5=other relative
	6=friends
	7=other

25a. If you were unemployed, would you relocate to a new community to get a job? __ Yes __ No

25b. If you were not employed in your training area, would you relocate to get a job in your field? __ Yes __ No

25c. If no, why? _____

1=never would move, don't want to leave
2=family and friends
3=children (schools and neighborhood)
4=money (insufficient)
5=business, or own home
6=bold climates
7=don't want to live in large or small city
8=other

26.

Who	Subject	Teaching Method	Purpose

Who	Subject
1=company	1=academic
2=public schools	2=job related
3=private schools	3=hobby (guitar lessons, etc.)

Teaching Method	Purpose
1=lecture	1=further education
2=text	2=increase job skills
3=practice	3=entertainment

PERSONAL & COMMUNITY

27a. Do you think your TAT training limits you to the one job area for which you were trained? __ Yes __ No If yes, why? _____
1=hard to find job in training area
2=limits graduate to only one job area

27b. Do you think TAT officials ever misled or misinformed you?
__ Yes __ No How or what was done?
1=disappointed about job placement
2=expected job w/ Union Carbide
3=not being hired in training area
4=false promises and misleading information
5=disciminating policies
6=lack of training

28a. Some people have difficulty adjusting to a new job or a new community. What was the worse problem you faced in this situation? How did you handle it?
0=adjusting to a new community
1=adjusting to shiftwork and/or unusual hours
2=getting along with people
3=housing problems
4=getting along with supervisor
5=finding a place to live
6=transportation to job
7=financial difficulties
8=job problems

28b. Many graduates have developed very good ways of adjusting to new situations. What are some of the ways you have found that tended to make adjusting to a new job or community easier?
1=be interested in and diligent at job
2=getting along well with coworkers and people in community
3=stick with it
4=obey rules and follow orders
5=have a "nest-egg" for survival money and a tight budget

SUPERVISOR

4. Company _____ Address _____

5. What was the time period in which this employee worked for you?
Began _____ (mo/yr) Ended _____(mo/yr)

6. Were you the first supervisor this employee had while working for this company? __ Yes __ No If no, can you tell us who was his first supervisor in this company? _____

7. Pay Change: I=increase N=None D=Decrease Title Change: P=Promotion T=Transfer D=Demotion

Reason: Place letter(s)

8. Did this individual have any problems adjusting to his job?

__ Yes __ No

9a. Code the problem letter, the importance, and the frequency--if more than five problems code the serious ones first.

1=Serious
3=Minor
4=Frequent
5=Infrequent

Problem letter
Importance
Frequency

9b. Problem letter
Resolution
Began
Ended (duration)

Resolution: 1=resolved by self
2=resolved with aid from supervisor
3=resolved with aid from company
4=resolved with aid of friends
5=unresolution
6=other

INDIVIDUAL EMPLOYEE

1a. What date was he hired? _____

1b. Is he still employed by you? __ Yes, or date of termination _____

1c. How did he come to apply for this job?

1=through TAT
2=through Employment Services
3=through friends or relatives
4=respond to ad
5=own initiative
6=company recruitment
7=other

1d. What were the specific reasons for his termination?

1=terminated for cause
2=quit (voluntary)
3=layoff
4=unknown or other
5=absenteeism, lateness
6=alcoholism-drugs
7=sickness-injury
8=inability to get along with supervisor, coworkers
9=inadequate production

2. Does the company have a performance evaluation system? __Yes __No

3. How does this employee compare to other employees in the same type of job with the same experience? __ superior; __above average; __average; __below average; __poor

4. Has this employee had problems on this job? __ Yes __ No

5. Specify each known problem, the time period in which the problem lasted (month/year), and the severity of the problem (1=very severe; 2=serious [needed connection], 3=minor). Then rank with 1= worst problem, etc.

Problem	Began	Ended	Severity	Rank

1=absenteeism, tardiness
2=illness
3=lacking educational skills
4=lacking task skills
5=coworker conflicts
6=supervisor conflicts
7=poor attitude towards company
8=poor attitudes to work routine
9=other

6. Has this employee had to work different shifts? __ Yes __ No

During what periods? _____

7=continual shiftwork
8=regular (cyclical)
9=occasional

7. Have there been any periods of layoffs or strikes in the period in which this graduate worked for you? __ Yes __ No _____

4=layoff
5=strike
6=other

8a. What was this employee's job title when hired? _____

8b. What was this employee's pay rate when hired? _____

9c. Nature of change

Specific change (Max. 2)

Reason (Max. 2)

Nature of Change	Specific Change	Reason
1=pay change	4=pay decrease	code the letter(s) placed
2=title change	5=pay increase	in the square
3=both change	6=promotion	
	7=transfer	
	8=demotion	

INDIVIDUAL JOB HISTORY

1. The _____ job held after graduation with (firm) _____

   Firm address _____

2a. Job title when hired _____

2b. Pay rate when hired _____ per _____.

2c. Average no. hours worked per week when hired was _____ hours per week.

2d. Were your job duties when hired related to your TAT training?

__ Yes __ No __ To some degree

3a. Current or final job title _____

3b. Pay rate currently or final _____ per _____

3c. Average no. hours worked per week (current or final) _____ hours per week.

3d. Were your current or final job duties related to your TAT training?

__ Yes __ No __ To some degree

3e. During this job were there any long periods of unemployment caused by strikes, layoffs or the like? __ Yes __ No (specify cause, dates and length of time _____

1=strikes
2=weather
3=layoff; lack of work; slow period
4=termination
5=military duty
6=sickness and injury
7=miscellaneous

4. What skills did you have to add to your TAT training to perform this job; and do you think TAT should have taught them?

A=highly technical and/or specialized skills
B=general laborer, clerical, semi-skilled
C=electronics and electrical skills
D=more industrial behavior courses
E=drafting and drawing skills
F=plumbing, pipefitting, pressure work

g=mechanical, maintenance, repair skills
H=process operation
I=experience with different tools and machines
J=expand current training
K=machining and machine shop operation
L=metalography
M=welding

TAT should teach __ Yes __ No

5.

	Like Very Much	Like	OK Average	Dislike	Dislike Very Much
Starting pay					
Current final pay					
Job duties					
First supervisor when hired					
Current or final supervisor (check if same) _____					
Coworkers					
Company (check if no union _____					
Union					
Job as a whole					

6. The thing I dislike(d) most about this job was _____

0=interpersonal relations
1=shiftwork
2=location
3=transportation problems
4=pay too low
5=general working conditions--safety, dirt
6=specific working conditions
7=routine monotonous
8=don't like the work in general
9=company policy, organization

7. The thing I dislike(d) most about the company was _____

A=low pay
B=slow promotions
C=lack of organization
D=prohibiting union
E=discrimination/favoritism
F=lack of consideration/interest in employees
G=lack of credibility/lying
H=general rules and policy

I=company benefits
J=layoff policies/job security
K=harrassment of workers
L=labor relations/poor communications

8. The thing I dislike(d) most about my foreman was _____

1=foreman overbearing
2=personality problems with foreman
3=supervisor incompetence
4=discrimination/favoritism
5=hostile to TAT graduates
6=lack of credibility

9. The thing I dislike(d) most about my coworkers was _____

1=racism/prejudice
2=general "not getting along"
3=generation gap
4=back-biting
5=lack of cooperation/competition

10. The thing I dislike(d) most about my union was _____

1=not strong enough
2=ineffective/do nothing
3=disorganized/handled poorly
4=won't back worker

11. The reason I left the job was _____

A=found better job
B=pay too low
C=terminated/fired
D=laid off
E=location
F=job completed
G=problems with other workers
H=transportation
I=school
J=military
K=change fields
L=didn't like work
M=employer misleading

12. Most people have problems in adjusting to jobs. We would like you to tell us, first the problems you had immediately after graduating (or leaving your previous job), second, how severe the problems were (1=very severe, created very serious problems; 2=annoying, personally discomforting; 3=minor problem), third, when it began and when it ended.

Problem	Began	Ended	Severity	Rank

1=shiftwork
2=job too difficult
3=inadequate finances
4=finding a job
5=transportation
6=finding affordable housing
7=personnel conflicts
8=company gave misleading information
9=discrimination and/or racism

VITA

Samuel Thomas Cooper was born in Windsor, Missouri, on June 14, 1940. He attended a rural elementary school and graduated from Windsor High School in 1958. He then enrolled in the University of Missouri where he earned a B.S. in Agricultural Economics in 1963 and an M.S. in Agricultural Economics in 1965. He accepted a teaching position in Economics at Bemidji State College, Bemidji, Minnesota in the Fall of 1965 and moved to a teaching position in Economics at North Dakota State University, Fargo, North Dakota the following year. In September 1967 he entered the Graduate School at the University of Tennessee. In 1969 he accepted a teaching position in Economics at East Tennessee State University, Johnson City, Tennessee. He became the education specialist for the First Tennessee-Virginia Development District the following year. In 1972 he returned to the University of Tennessee where he completed the research portion of his dissertation. He then became a Manpower Specialist with Cornell University and now works as a County Agent in Manpower. He received his Doctor of Philosophy degree with a major in Agricultural Economics in March 1975.