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Rural People in Skilled Industrial Work: Experience of Graduates of a Manpower Training Program in Appalachia

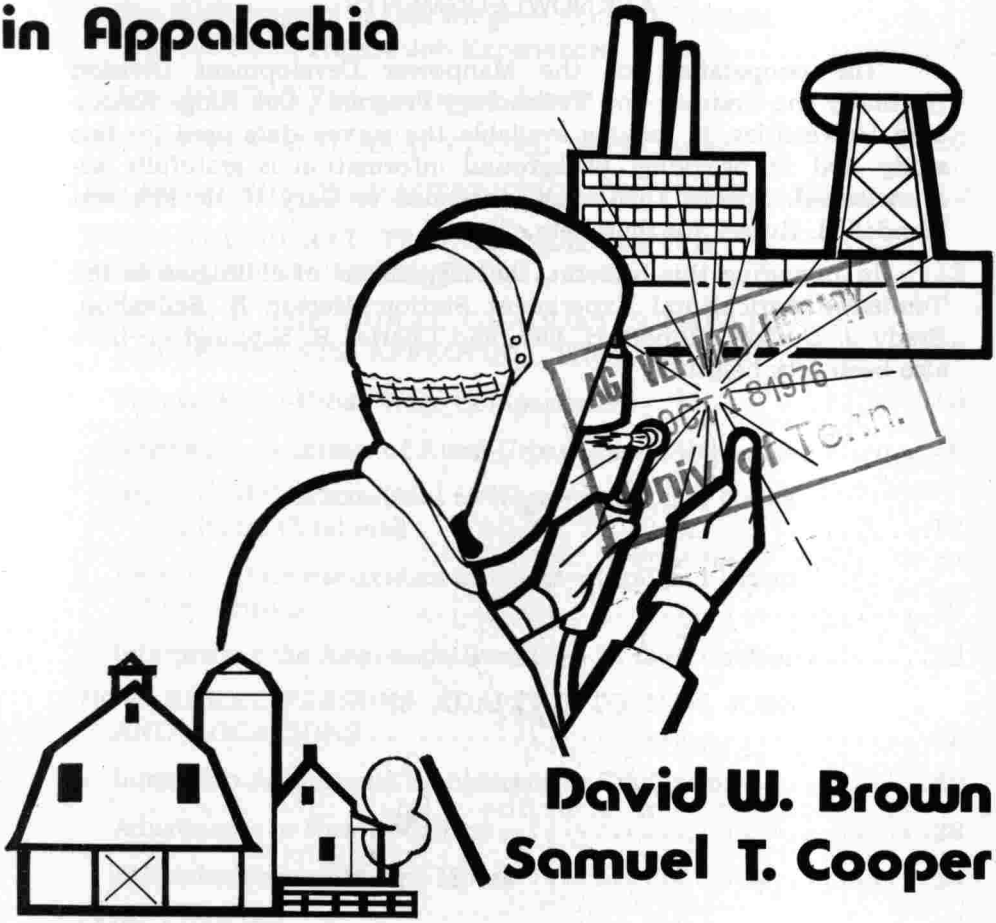

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TABLE OF CONTENTS

PAGE

SUMMARY 4

INTRODUCTION 6

New Job Outlets and Training Needs for Rural People 6

Recent Manpower Development Efforts 6

Do Rural People Have Special Preparation Needs? 7

The TAT Program at Oak Ridge—a Source of Insight about Rural Trainee Job Experiences 8

The 1972 TAT Post-placement Survey 9

OBJECTIVES AND ANALYTICAL APPROACH 10

BACKGROUND CHARACTERISTICS OF THE TRAINEES . . . 11

WHAT THE RURAL TRAINEES DID AFTER GRADUATING FROM TAT 12

HOW MUCH THE RURAL GRADUATES EARNED, AND ELEMENTS AFFECTING THIS 15

Tabular Rural-Urban Wage Comparisons 15

Regression Estimates of Rural-Urban Wage Differences 16

Relation of Characteristics to Wages—Rural and Urban Graduates Combined 17

Relation of Characteristics to Wages—Rural and Urban Comparisons 20

Interpreting the Regression Results—a Note of Caution 22

HOW RURAL PERSONS ADAPTED TO NEW JOBS AND LOCATIONS 22

Initial Job Adjustment Problems after Graduation 22

Adustments to New Locations 23

Attitudes Toward Future Moves 24

CONCLUSIONS 26

SUMMARY

Information from a follow-up survey of graduates of an experimental industrial skills training program at Oak Ridge was analyzed to learn how persons of rural origin had fared relative to those with urban backgrounds. Post-training job and relocation histories were examined. Hourly wage rates at the time of the survey (1972) were compared. Effects of several personal characteristics on wage rates were estimated. Problems associated with post-training jobs and moves, as well as attitudes toward future relocation, were identified.

The sample survey on which this study is based included information for 472 persons who had been in the Oak Ridge Training and Technology (TAT) Program during the 1966-71 period. Of these, 173 had origins in rural areas and small towns of Tennessee and elsewhere in Appalachia; 299 had come from cities and suburbs, mostly in the South but some from Chicago. Nearly three-fourths were from disadvantaged backgrounds. The modal rural person in the survey was a white single male in his early 20's who had completed high school and who did not have a regular job when entering the TAT training program. About half of the urban group were nonwhite. Fifty percent of the rural persons were trained in machining; the remainder specialized in welding, machine operation, physical testing, drafting, or electronics while at TAT.

The post-training experiences of the rural and urban groups were similar in several respects. Nine out of ten had regular jobs when interviewed by TAT in 1972. Three-fifths still held the same job they had taken after graduating from the training program. Two-thirds were in jobs that related at least partly to their training specialty. More than 7 out of 10 had gone from TAT into jobs that did not entail moves to new locations.

Subsequent relocation, either to take better jobs or to be nearer the jobs they already had, was more common among the rural graduates; 55% of the rural graduates in the sample had relocated at least once, by mid 1972, compared to 40% of the urban graduates. Job terminations or layoffs were less frequent in the rural group than in the urban group. In the initial jobs taken, the graduates more often utilized their training specialties.

The average wage per hour in 1972 was $3.49 for the persons from rural areas, and $3.29 for those from urban areas. Regression analysis was used to "correct" for other possible influences on wage rates—sex, race, age, education, job status before TAT training, TAT training specialty, extent utilizing specialty, years since TAT training, and number of jobs since TAT training. When these were assumed

to be similar, the average wage of rural graduates was estimated to be 9¢ per hour less than that of urban graduates. This difference was not statistically significant.

The regression results showed also that, for the survey group as a whole, wage rates tended to be notably higher for those who were male, who were utilizing their training specialty, who had been out on the job longest, or who had not changed jobs. Having some education beyond high school seemed to be particularly helpful to the rural trainees.

Relatively few of the rural graduates—36% against 51% of the urban graduates—reported having serious problems related to their new work after completing TAT training. Their most common adjustment problem was getting used to shift work schedules. In most instances, these initial problems had been resolved after a few weeks.

Most from rural areas who had relocated had not encountered serious difficulties related to their moves. Some did mention problems of finding suitable housing. Homesickness was not a dominant problem. However, desire to be near friends and relatives did seem to be an important consideration for many who had chosen not to relocate or who were hesitant to move in the future.

Most respondents said they would be willing to make future moves if they found themselves out of work or if they could obtain jobs that better utilized their skills. The rural group was somewhat more reluctant than the urban group in this regard. A number had plans to move within the same vicinity to better houses or neighborhoods.

The special help provided by the TAT program in personal counseling and job placement probably reduced the problems encountered after training. But, overall, this analysis does suggest that persons from rural areas are able to adapt well to industrial work settings involving use of technical skills.

RURAL PEOPLE IN SKILLED INDUSTRIAL WORK:

Experience of Graduates of a Manpower Training Program in Appalachia

by David W. Brown and Samuel T. Cooper*

INTRODUCTION

New Job Outlets and Training Needs for Rural People

Since World War II many young adults in rural Tennessee, as well as in other parts of Appalachia and the U.S., have found it desirable to prepare themselves for jobs in industry and commerce. Demands in farming, mining, and other traditional occupations for workers without special skills have declined. The rapid economic growth and technological "explosion" of the 1950's and 60's opened up new job opportunities for rural people—not only in the major cities, but also in smaller places within commuting distance of their original homes. Some have been able to obtain such work and progress well without prior specialized training. But increasingly employers need and prefer workers who have technical skills, and who are able to adapt well to industrial work settings and grow in performance as they gain experience.

Recent Manpower Development Efforts

In response to these needs for skilled workers in industry, much attention has been given to the expansion and improvement of manpower training. High schools in rural areas have tended to shift from their earlier emphasis on training in vocational agriculture toward a broader range of vocational curricula. Area training centers have been established. Reflecting their greater technological orientation, the military services have provided enlisted men and women with training in mechanics, electronics, and other skills. This military training has been important in launching subsequent civilian careers. Many large companies have comprehensive in-service training and guidance programs to help employees upgrade their skills and adjust to job demands.

Manpower development activities have been reinforced by a number of Federal programs. Among others, these stem from the

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Manpower Development and Training Act, the **Vocational Education Act,** and the **Economic Opportunity Act** of the early 1960's; and the **Comprehensive Employment and Training Act** of the early 1970's. Support of vocational education facilities has been a major part of the Appalachian Regional Commission's undertakings.

Such programs have led to expansion of vocational education in local and area schools, more on-the-job training, and more attention to basic education and counseling needs of persons entering job markets. Federal sponsorship of research and pilot projects on manpower development has generated new insights about effective vocational training and retraining, and elements for success once on the job. In the programs of the past decade, special attention has been given to the needs of school dropouts, disadvantaged groups, and displaced workers in declining occupations.

These actions, along with companion initiatives at the state and local levels, have resulted in many new opportunities for people in Tennessee to develop skills that are in keeping with future employers' needs. One avenue for continued strengthening of vocational training programs has been afforded by the **Tennessee Comprehensive Vocational Education Act** of 1973.

Do Rural People Have Special Preparation Needs?

In Tennessee and other portions of Appalachia, many people receiving vocational training have been—and will continue to be—from farms, rural nonfarm families, and small towns. This raises several questions that have important bearing on educational and counseling efforts in non-metropolitan areas:

. . . . Does the vocational training that rural people receive enable them to obtain specialized industrial jobs, and do well?

. . . . Do they have any special problems in adjusting to industrial work settings and to urban living conditions?

. . . . How important are such factors as age, previous work experience, and general educational background in job success?

. . . . To what extent are rural persons inclined to move after training in order to take advantage of job opportunities?

Various studies of post-training experiences have called attention to special problems and needs of persons from "inner cities," minority groups, and other distinct backgrounds. For example, it appears that attention to basic education and to formation of attitudes compatible with industrial work settings may be as important as the specialized training itself in many instances. However, relatively little is known about the extent to which people from

rural areas have special needs when preparing them for skilled occupations.[1]

The TAT Program at Oak Ridge—A Source of Insight about Rural Trainee Job Experiences

An opportunity to learn more about the experiences of people from rural areas who have received industrial training is afforded by the Training and Technology (TAT) Program at Oak Ridge, Tennessee.

The TAT Program was established in 1966 by Oak Ridge Associated Universities in cooperation with the Union Carbide Corporation, which operates nuclear-related production facilities at Oak Ridge. With the help of funds from the Manpower Development and Training Act and the Atomic Energy Commission, TAT undertook a pilot effort to devise, try out, and evaluate improved approaches for preparing young adults for selected industrial occupations. Emphasis was placed not only on faster and better training itself, but also on innovations in recruitment, selection, personal counseling, supportive services, and job placement. The major training areas included machining, physical testing of materials, welding, mechanical operations (sheet metal work, pipe fitting, etc.), drafting, and electronics.

Between 1966 and 1973, more than 2,000 persons completed TAT training cycles. Improvements in training methods reduced the time needed for the typical trainee to reach performance standards from a year to 6 months. Most trainees were young adult males with high school education or less. Emphasis was on recruitment of

[1]For a recent overview of changing employment patterns of U. S. rural people and manpower programs serving them, see: Ray Marshall, **Rural Workers in Rural Labor Markets** (Salt Lake City: Olympus, 1974).

Researchers in the Tennessee Agricultural Experiment Station have completed studies of migration and commuting patterns of rural people, and socioeconomic elements associated with moves to urban places and industrial employment. For example, see:

Brady J. Deaton and Kurt R. Anschel, "Migration and Return Migration: A New Look at the Eastern Kentucky Migration Stream," **Southern Journal of Agricultural Economics**, July 1974, pp. 185-191.

Frank O. Leuthold, "Commuting Patterns of the Tennessee Population," **Tennessee Farm and Home Science**, October-December 1974, pp. 6-9.

Larry C. Morgan and Brady J. Deaton, "Psychic Costs and Factor Price Equalization," **Southern Journal of Agricultural Economics**, July 1975, pp. 233-238.

Thomas H. Klindt and George F. Smith, "Relocation Plans of High School Seniors in Selected Rural Counties of Tennessee," **Tennessee Farm and Home Science**, October-December 1975, pp. 37-40.

under-employed or unemployed persons from disadvantaged situations. The trainees came not only from rural and urban areas of Tennessee, but also from other Appalachian localities and large cities East of the Mississippi. After the TAT training, some took jobs in or near their original homes, while others moved to other states or regions.[2]

The 1972 TAT Post-Placement Survey

In 1972 TAT conducted a stratified random sample survey of its previous graduates to learn how they had fared in subsequent jobs and to identify problems that they may have had. Of the 1,659 persons who had completed regular TAT cycles, 472 were contacted and interviewed in their various locations throughout the East. Each was asked questions about his or her employment, wage, and location history since TAT training; problems encountered on the job and in adjusting to new location; reasons for any job changes; attitudes toward changing locations in the future; handling of family finances; and community activities. Job supervisors were asked companion questions about job performance, problems observed, and the general work setting. In the analysis, this survey information was augmented with facts from TAT's records about these trainees' demographic characteristics, pre-training education and work history, and performance during training. The basic characteristics of the persons in the sample proved to be quite representative of all the TAT graduates.

Of the 472 TAT graduates interviewed in the post-placement survey, 173 had origins in rural places—towns, villages, or open-country areas. The remaining 299 had lived in cities or suburbs prior to their training. Overall, 89% were from Tennessee. Some of the rural graduates were from nearby Appalachian states, and some of the urban graduates were from elsewhere in the South as well as Chicago.[3]

[2]In 1973 the TAT program was reorganized into a new Manpower Development Division (MDD) of the Oak Ridge Associated Universities (ORAU). The Union Carbide industrial training program at Oak Ridge continued. Research emphasis turned toward extensions and adaptations of the TAT model to various school and industrial training settings in other locations of the U. S. Detailed reports about these activities are available from MDD/ORAU, P. O. Box 117, Oak Ridge, Tennessee 37830. An overview of the TAT Program through 1972 is provided in the U. S. Department of Labor Manpower Research Monograph No. 29, **A Model for Training the Disadvantaged: TAT at Oak Ridge, Tennessee**, 1973.

[3]For more about the survey and its overall findings, see the report by Charles C. Worth and others, **Training and Technology Postplacement Follow-up**, Oak Ridge Associated Universities, April 1973.

TAT had no plans to examine the survey results from the standpoint of rural-urban trainee comparisons. So arrangements were made for this to be done through the auspices of the Tennessee Agricultural Experiment Station. It was felt that such analysis would provide helpful insights to employers, vocational counselors and educators in non-metropolitan areas, and rural young people themselves. This bulletin summarizes that analysis, which drew upon selected portions of the TAT survey information.[4]

OBJECTIVES AND ANALYTICAL APPROACH

The analysis reported in this bulletin had three main objectives:

1. To compare the post-training job experiences and earnings of rural and urban graduates in the TAT follow-up survey.
2. To ascertain how the post-training wage rates of these graduates were related to their educational background, prior work experience, job mobility, and other selected characteristics.
3. To find out whether rural graduates had encountered problems in adjusting to industrial work settings and new locations that were notably different from urban graduates.

Descriptive profiles of the rural and urban groups were developed from the survey data. This provided a basis for general comparison of their background characteristics, post-training work histories, earnings, and adjustment problems.

However, tabular comparison of the average earnings of the rural and urban trainees can be misleading. It could be that other differences besides the rural-urban background distinction affect wages. For example, in this particular sample those who had been working longer tended to be of rural origin. Other things equal, one would therefore expect the average 1972 wage rate of the rural group to be higher than that of the urban group.

To refine the analysis, multiple regression was used to a) standardize the basis for comparing wages of the rural and urban groups and b) estimate the relationships between several personal characteristics and these wages. The dependent variable was hourly wage rate at the time of the survey in 1972. Independent variables included: rural/urban origin; sex; race; marital status; age; education;

[4]More details of the study on which this bulletin is based are presented in the Ph.D. dissertation by Samuel T. Cooper, **An Economic Evaluation of the Training and Technology Program, Oak Ridge, Tennessee, 1966-70** (University of Tennessee, Department of Agricultural Economics and Rural Sociology, March 1975).

employment status just prior to TAT training; training specialty; extent that the job held was related to training; year of TAT training; and number of jobs held since TAT training.

Of these variables, only wage rate and age were measured in terms of integer numbers. Indicators of the others, which were available in coded form only as categories, were incorporated into the regression analysis as "dummy variables."

BACKGROUND CHARACTERISTICS OF THE TRAINEES

In comparing the post-training experiences of the rural and urban TAT graduates in the sample, it is helpful first of all to know something about their personal characteristics and backgrounds.

Their origins by community types were as follows:[5]

		No. of persons	Pct.
"Rural" graduates from	towns or villages	75	43
	outlying areas	98	57
		173	100
"Urban" graduates from.	large cities	41	14
	small cities	173	58
	suburbs	22	7
	undefined urban settings	63	21
		299	100

As shown below, the trend was for more of the trainees to come from urban backgrounds as the TAT program evolved during the 1966-71 period:

	Rural	Urban	Recruiting emphasis
1966-67	18 (50%)	18 (50%)	Persons from 19 East Tennessee Counties
1967-68	17 (47%)	19 (53%)	Tennessee-wide
1968-69	49 (46%)	57 (54%)	Unemployed and disadvantaged from Tennessee
1969-70	45 (39%)	71 (61%)	Disadvantaged from other Appalachian states and Chicago
1970-71	44 (25%)	134 (75%)	Urban minorities and Appalachian rural

[5]This classification was based on TAT trainee records. Precise definition of community types and sizes was not possible. For 63 of the trainees, no information was available other than that they were members of groups recruited from urban areas.

Some background characteristics of the graduates interviewed in the follow-up survey are shown in Table 1. Most were in their early or mid-20's at the time of their TAT training, but a few were still in their teens and a few others were in their 40's or 50's. More than two-thirds of the rural-urban group as a whole had finished high school or its equivalent. Reflecting TAT's efforts to recruit trainees from "disadvantaged" socio-economic backgrounds, three-fourths were in this category. Nearly all were males. Three out of five did not hold regular jobs when they entered the TAT program.

There were notable differences between the rural and urban graduates surveyed. More than half of those with urban backgrounds were nonwhite; only 8% of those from rural areas were nonwhite. Before entering the TAT program, more of the urban group had received some specialized training through vocational school, military, or on-the-job programs. In their training at TAT, the rural group had tended to concentrate more heavily in machining as a specialty than had the urban group.

WHAT THE RURAL TRAINEES DID AFTER GRADUATING FROM TAT

From the coded results of the follow-up survey it was possible to gain a general picture of the work and locational histories of the trainees after completing their programs at TAT (Table 2).

The rural and urban groups were similar in a number of respects. About nine out of ten were holding regular jobs at the time of the interviews in 1972. Few were working less than 40 hours a week. Most were still in the first job that they had taken after leaving TAT, though one-third had held two or three jobs (not necessarily with different employers) and a few had held four or more jobs. At the time of the survey more than two-thirds were in work that related at least partly to the technical training they received at TAT.

One difference was that, more often than rural graduates, the urban graduates had taken jobs at first which were not related to their training specialty and then later found work that utilized their skills to fuller extent.

More than 7 out of 10 of the graduates had returned to their home towns and cities for their first job after TAT training, but by 1972 nearly half had moved at least once. Some of these moves were to distant places; others were merely relocations in the same vicinity. More of the rural graduates (55%) had made job-related moves than the urban graduates (40%) by the time of the survey.

Table 1. Background characteristics of 472 graduates of the 1966-70 TAT program

	Rural background		Urban background	
	Number	Pct.	Number	Pct.
Total number in the 1972 sample[a]	173		299	
Age when entered the TAT program				
Less than 20 years	28	16	89	32
20-29 years	115	66	161	57
30-39 years	20	12	24	9
40 years or older	10	6	7	2
Average age	(24)		(22)	
Sex				
Male	165	97	276	93
Female	5	3	20	7
Race				
White	159	92	137	49
Nonwhite	14	8	144	51
Marital status in 1972				
Single	92	53	174	62
Married	75	43	98	35
Separated, divorced, or widowed	6	4	8	3
Socio-economic-background[b]				
Disadvantaged	93	68	202	77
Nondisadvantaged	43	32	59	23
Education				
Less than 12 years	26	16	48	17
12 years (high school) or equiv.	122	73	187	66
College or training beyond high school	19	11	50	17
Specialized training before TAT				
None reported	129	74	163	54
Less than one school year	15	9	17	6
One school year (about 30 weeks)	20	12	108	36
More than one school year	9	5	11	4
Job status when entered TAT program				
Unemployed	105	62	174	59
Employed	65	38	122	41
Training area in the TAT program				
Machining	85	50	103	35
Welding	25	15	25	8
Mechanical operations	22	13	50	17
Physical testing	21	12	44	15
Drafting	9	5	40	13
Electronics	8	5	23	8
Chemical technology	–	–	11	4

[a]Totals for some characteristics in this and other tables are less than the number surveyed because this information was not available from the questionnaires or TAT records for all persons.

[b]Based on U. S. Department of Labor classification, whereby a "disadvantaged" individual was defined as 1) a person who was poor or a member of a poor family, 2) without suitable employment, and 3) a school dropout, member of a minority, under age 22 or over 45, or handicapped.

Table 2. Post-training job and location history, 472 graduates of the 1966-70 TAT program

	Rural background		Urban background	
	Number	Pct.	Number	Pct.
Total number in the 1972 sample	173		299	
Job status in mid 1972				
Employed	153	88	272	91
Unemployed	19	12	26	9
Number of jobs held since TAT training				
None	4	2	4	1
1	107	62	187	63
2	38	22	70	23
3	20	12	30	10
4 or more	4	2	8	3
Relation of **most recent** job to area of TAT training[a]				
Duties related	101	60	154	53
Duties somewhat related	13	7	42	14
Duties not related	55	33	97	33
Relation of **previous** job to TAT training specialty[ab]				
Duties related	37	62	41	39
Duties somewhat related	6	10	5	5
Duties not related	18	28	59	56
Relation of **the job before that** to area of TAT training[ac]				
Duties related	9	39	8	22
Duties somewhat related	5	22	5	13
Duties not related	9	39	24	65
Average hours worked per week in most recent job				
Less than 40 hours	2	1	7	2
40 hours	144	85	241	83
More than 40 hours	23	14	45	15
Location of first job after completing TAT training				
Entailed moving to a new place	41	25	84	30
Did not entail moving to a new place	120	75	198	70
Number of job-related moves after completing TAT training				
No moves from original home reported[d]	78	45	179	60
Relocated once	72	42	93	31
Relocated twice	16	9	21	7
Relocated 3 or more times	7	4	6	2

[a]These reflect **final** duties in the job held. There was a slight tendency for initial duties in a new job to be less frequently training related.

[b]Only those who had at least two jobs after TAT training are included here.

[c]Only those who had at least three jobs after TAT training are included here.

[d]This category may include some nonresponses to the question.

This could reflect a number of elements, such as greater difficulty in finding good jobs in or near their non-urban home settings, or desire to live closer to the places where they did find work. (In this particular sample, the fact that more of the rural trainees had finished their training earlier could help account for their having made more moves by 1972.)

Those who were unemployed or had held more than one post-training job at the time of the survey were asked why they had not stayed with their previous job. Several reasons were given (Table 3). Having sought and found better jobs was more common among the rural graduates than among the urban graduates. Having been forced to seek new jobs because of layoffs, job completion, or termination by employers was more frequent among the urban graduates.

Table 3. Reasons for leaving previous jobs, 179 graduates of the 1966-70 TAT program surveyed in 1972

	Rural background		Urban background	
	Number	Pct.	Number	Pct.
Total number who gave reasons for leaving previous jobs	64		115	
Major reason given for leaving previous post-training job				
Found a better job	30	46	27	24
Job paid too little	6	9	12	10
Terminated or laid off by employer	9	14	34	30
Job was completed	–	–	3	3
Wanted to change fields	3	5	–	–
Didn't like the work	2	3	8	7
Had been misled by employer	1	2	4	3
Had problems with co-workers	2	3	4	3
Disliked the location	7	11	14	12
Had transportation problems	1	2	2	2
Went to school or the military	3	5	7	6

HOW MUCH THE RURAL GRADUATES EARNED, AND ELEMENTS AFFECTING THIS

How did the earnings of the rural and urban TAT graduates compare? Though it doesn't necessarily reflect their total annual income, information from the post-placement survey about their hourly wage rates provides helpful insight.

Tabular Rural-Urban Wage Comparisons

Simple tabular comparison suggests that, in the 1966-70 training groups, the rural graduates were faring at least as well as the urban graduates. Information about their most recent wage rates

was provided in the 1972 survey by 169 rural graduates and 292 urban graduates. The average rural graduate was earning $3.49 an hour—6% more than the urban average of $3.29 an hour. Wage rate distribution was as follows:

	Rural background		Urban background	
	No. of persons	Pct.	No. of persons	Pct.
Less than $2.00	16	9	24	8
$2.00 — $2.99	39	23	74	25
$3.00 — $3.99	51	30	122	42
$4.00 — $4.99	57	34	61	21
$5.00 or more	6	4	11	4

Wage rates received in earlier jobs held after TAT training were also slightly higher for rural graduates than for urban graduates.[6]

Regression Estimates of Rural-Urban Wage Differences

It cannot necessarily be concluded from such straightforward comparisons that the rural graduates had innate qualities that caused them to fare better than the urban graduates. Other differences between the two groups could obscure the true picture.

Accordingly, the multiple regression analysis outlined earlier in this report was employed 1) to refine the rural-urban group wage comparisons, and 2) to isolate the relationships between certain personal characteristics and post-training wages. The following variables and indicators were included:

Dependent variable. . . . . Wage rate per hour in main job at the time of the survey in mid-1972 or in last previous job

Independent Variables . Pre-training background: rural; urban
Sex: male; female
Race: white; nonwhite
Marital status: married; nonmarried
Age: in years, entered both directly and as a squared term to allow curvilinearity
Education: less than high school; completion of high school or equivalent;

[6]The median hourly wage of the TAT sample group as a whole was in 1972 more than double their median pre-training wage rate, and notably higher than the median for graduates of other Manpower Development and Training Act programs in the U. S. See Charles C. Worth et al., op. cit., pages 13-16, for more detail.

vocational or university education beyond high school (prior to TAT training)

Employment: status just before starting TAT training: had regular job; did not have regular job

Specialty of training at TAT: drafting; physical testing; electronics; machining; mechanical operations; chemical technology; welding

Extent latest job utilized TAT training specialty: related; somewhat related; not related

Year began TAT training: 1966; 1967; 1968; 1969; 1970

Number of regular jobs since graduating from TAT: one; two; three or more

Complete information was available for only 367 of the 472 TAT graduates interviewed in the post-placement survey—155 rural and 212 urban. Though there is no particular reason to expect distortion, persons included in the regression analysis may not fully reflect relationships for the entire survey group.

The estimates presented in Table 4 are based on analysis that included these 367 graduates in a single regression model. Their rural-urban background differences were treated as a dummy variable along with other independent variables. The results are that, **when other characteristics and their relationships to wages were assumed to be similar, there was little apparent difference in the predicted hourly earnings of these rural and urban groups.** Other things equal, the average rural graduate in this sample would be earning only 9¢ less than his or her urban-origin counterpart at the time of the survey. (This difference was not statistically significant.)

Relation of Characteristics to Wages—Rural and Urban Graduates Combined

What about the relationship between other characteristics and wage rates? Some insight is provided by the regression model which considered both rural and urban graduates as a combined group (Table 4). Links between their 1972 wage rates and four characteristics stand out as especially notable. Other variables constant:

1) **Those who had changed jobs one or more times since TAT graduation were earning on the average nearly a dollar less per hour than those who had stayed with their initial**

Table 4. Estimated regression relationships between 1972 hourly wages and selected individual characteristics, 367 of the TAT graduates in the follow-up survey

	Predicted 1972 wage per hour	Probability of no true relationship between this variable and wage rate[c]
Predicted average wage for . . .		
Rural background male, white, not married, age 24, high school education, unemployed when entered the TAT program, trained and working in machining specialty, entered TAT training in 1970, no job changes since TAT graduation	$3.74	
Predicted average change in wage rate from the above if . . .		
Urban background instead of rural[a]	+ .09	.62
Female instead of male[a]	− .49	.03
Nonwhite instead of white[a]	− .17	.13
Married instead of unmarried[a]	no change	.94
Younger or older than 24, for example:[b]		.20
20 years of age	− .10	
28 years of age	+ .07	
32 years of age	+ .11	
36 years of age	+ .12	
Other than high school education:[a]		.28
Less than high school completion	− .11	
More than high school completion	+ .18	
Employed instead of unemployed when entered the TAT program[a]	+ .19	.05
Trained and employed in specialty other than machining:[a]		.13
Drafting	− .29	
Physical testing	− .12	
Electronics	− .07	
Mechanical operations	+ .10	
Chemical technology	+ .20	
Welding	+ .29	
Job held was not fully utilizing specialty:[a]		.0001
Only somewhat related to training	− .28	
Not related to training	− .53	
Began TAT training before 1970:[a]		.0001
1969	+ .60	
1968	+ .74	
1967	+ .40	
1966	+ .79	
Had changed jobs since TAT graduation:[a]		.0001
Had held two jobs	− .93	
Had held three or more jobs	− .99	

[a]These characteristics were handled in the multiple regression model as dummy variables. In graphic terms, the model used permitted changes in intercept, but not changes in slope of these variables.

[b]These age-wage relationships based on the curvilinear function:

$$\$3.74 + (.07X - .001X^2),$$ where X equals age.

The coefficients come from the multiple regression results.

[c]Based on F test for classes of dummy variables and t test for age and age squared.

post-training placement. It was known from other survey information that some graduates did shift jobs to take advantage of better opportunities. But apparently there was a considerable element of changing jobs and losing ground with respect to earnings and promotions because of such reasons as work maladjustments, general layoffs, and desire to live somewhere else.

2) **The longer it had been since TAT training was begun and completed, the higher the wage.** This was as would be expected, since the earlier graduates had more years to gain experience and seniority, and to find jobs that made good use of their skills. The relationship was not consistent, however. The 1967 group was estimated to earn less than both the 1968 or 1969 groups after adjustments for other differences had been made through the regression analysis. Year to year variations in effectiveness of TAT training and placement assistance, or in trainee characteristics other than those included in the analysis, could help explain this inconsistency.

3) **Those who had jobs which fully utilized their TAT training earned more than those with jobs not or only partly related to their training specialty.**

4) **Women were earning nearly half a dollar less an hour than men.** This could reflect the fact that the TAT training was in specialties traditionally filled by males to a large extent. Employers may have been less ready to hire female graduates or to pay them comparable wages. Also, women may have been less able than men to take advantage of good job opportunities that entailed relocation. Since the analysis was based on the experiences of just a few women (only 25 in the entire TAT sample), these male-female wage comparisons may not indicate the bigger picture.

Though not as striking or statistically significant as the above relationships, the regression analysis suggested some other patterns too:

** Apparently having previous work experience helped. Those who had held regular jobs just prior to TAT training were earning a few cents an hour more than others when interviewed. (Significant at .05 level.)

** As might be expected, trainees with more education tended to be earning higher wages, though the difference was not significant.

** Graduates who were nonwhite were earning a few cents less than white graduates.

** Within the age ranges of the sample group, graduates who were older earned slightly more. But the gains associated with age were only a few cents an hour, and were almost none for those beyond their late 20's.

** The average wage difference between the lowest- and highest-paying skills was notable—58¢ an hour. Of course, the relative pay scales of these specialties may or may not continue to follow the same pattern in the future.

Relation of Characteristics to Wages—Rural and Urban Comparisons

The regression results just described are for the overall sample of TAT graduates. Were these relationships the same for the rural graduates as those with urban backgrounds? To examine this, the rural and urban groups were analyzed separately. The same regression model described earlier (except for elimination of the rural-urban dummy variable) was used for each. This division into two groups meant that there were only a few persons in some categories (for example, the very small number of rural nonwhites and women in the sample). So the resulting coefficients have to be interpreted with caution, and only general comparisons made (Table 5).

Relationships between predicted 1972 wage rates and several background characteristics were similar for the rural and urban groups. As in the overall analysis, females tended to earn less than males, and nonwhites slightly less than whites. Having a job that was related to one's TAT training specialty added notably to earning rate. In both groups, those who had been out on the job longer after TAT training earned more. The average person who had shifted jobs was earning less than those who stayed with their initial post-TAT employment.

One difference between the two groups was that education beyond high school apparently helped the rural-background graduates, whereas no strong relationship existed between wages and education for the urban graduates.

Rural graduates who had begun TAT training during their mid or late 20's were earning more than those who were younger. They were also earning more than older rural persons—those who had not undertaken TAT training until after they were 30 years old. There was no significant relationship between wages and ages for the urban graduates.

In terms of wage rates afterwards, having held regular jobs just before TAT training appeared to be slightly more helpful to the urban graduates than to the rural graduates. It may be that the persons reared on farms or in small towns have more opportunity

Table 5. Estimated regression relationships between 1972 hourly wages and selected individual characteristics, rural and urban TAT graduates analyzed separately

Assumed change in background characteristic	155 rural graduates: Predicted change in hourly wage	155 rural graduates: Probability of no true relationship	212 urban graduates: Predicted change in hourly wage	212 urban graduates: Probability of no true relationship
Female instead of male	− .42	.32	− .37	.19
Nonwhite instead of white	− .11	.65	− .25	.08
Married instead of unmarried	+ .08	.61	− .07	.06
Younger or older than 24, for example:		.01		.64
20 years of age	− .15		+ .10	
28 years of age	+ .56		− .07	
32 years of age	+ .16		− .11	
36 years of age	− .12		− .12	
Other than high school education:		.01		.61
Less than high school completion	− .04		− .18	
More than high school completion	+ .76		− .07	
Employed instead of unemployed when entered the TAT program	+ .08	.60	+ .17	.20
Trained and employed in specialty other than machining:		.09		.37
Drafting	− .15		− .26	
Physical testing	+ .18		− .22	
Electronics	− .65		+ .17	
Mechanical operations	+ .24		+ .15	
Chemical technology	not applicable		+ .32	
Welding	+ .39		+ .31	
Job held was not fully utilizing specialty:		.0001		.05
Only somewhat related to training	− .31		− .12	
Not related to training	− .75		− .36	
Began TAT training before 1970:		.0001		.0001
1969	+ .99		+ .37	
1968	+ .77		+ .64	
1967	+ .35		+ .20	
1966	+ 1.05		+ .91	
Had changed jobs since TAT graduation:		.0001		.0001
Had held two jobs	− 1.10		− .78	
Had held three or more jobs	− 1.42		− .76	

than their urban counterparts to gain informal work experience that partly substitutes for the benefits of formal employment during early adulthood.

Wage differentials among the various specialties did not follow the same pattern for rural graduates as for urban graduates. This could reflect differences in skill needs in the metropolitan and nonmetropolitan localities where trainees tended to return.

Interpreting the Regression Results—a Note of Caution

As is often true in studies of human behavior, these regression results need to be interpreted with care.

Only part of the variation in wage rates was explained by the independent variables included in the analysis. The multiple correlation coefficients (R^2) were .40 for the combined model, .58 for the rural model, and .36 for the urban model. Apparently there were additional factors that contributed to earnings differences among the TAT graduates. It may be too that relationships were obscured by inaccuracies in recording information, shortcomings of the indicators used, the grouping of some data into categories, and constraints imposed by the regression models themselves. The lower R^2 for the urban model could reflect the fact that the urban trainees were more diverse in geographic and personal background than the rural trainees.

The dependent variable, hourly wage at the time of the survey, reflects immediate job situations. It may not indicate long-term earnings trajectories.

The usual cautions apply about inferring too much from such analysis based on cross-sectional data. For example, as a group the urban trainees who had higher levels of formal education were not earning more than those with less schooling. Yet it could well be that an individual person could greatly enhance his or her earning power by completing more education.

HOW RURAL PERSONS ADAPTED TO NEW JOBS AND LOCATIONS

Some people speculate that workers from rural areas have more difficulty than urban persons in adjusting to industrial-type job situations and city living. Whether they readily move from their non-metropolitan home settings in order to take advantage of better job opportunities elsewhere has also been of interest. Questions were asked in the TAT post-placement survey about the ease with which the graduates had made these adjustments and their attitudes toward relocating. Following are tabular comparisons of responses by the rural and urban groups to some of these questions.

Initial Job Adjustment Problems After Graduation

Each respondent was asked whether there had been any problems in adjusting to new work situations after completing TAT training and, if so, to indicate the one that had been most serious. As shown in Table 6, notable adjustment problems were reported by only 36% of the rural graduates, compared with 49% of the urban

graduates. The most notable difficulty mentioned by rural graduates was getting used to the unaccustomed rigidities and working hours of shift work. Usually these initial problems had been resolved in a month or less, though a few said they persisted for several months or forced a change in work situation.

Especially during the latter part of the 1966-71 period, the TAT program gave special attention to helping the trainees adapt to industrial work situations, as well as providing placement assistance. So it could be that this survey group had less frequent or severe adjustment problems than graduates of many vocational training programs.

Table 6. Foremost problem in job-related adjustments after completing training, 472 graduates of the 1966-70 TAT program

	Rural background		Urban background	
	Number	Pct.	Number	Pct.
No serious problem reported	111	64.2	152	50.8
Getting used to shift work	23	13.3	26	8.7
New job too difficult	9	5.2	27	9.0
Inadequate finances	9	5.2	22	7.4
Finding affordable housing	5	2.9	15	5.0
Finding a suitable job	5	2.9	15	5.0
Misleading information given by employer	4	2.3	8	2.7
Personnel conflicts	4	2.3	5	1.7
Arranging transportation to work	2	1.1	23	7.7
Other serious problems	1	0.6	6	2.0
Total surveyed	173	100.0	299	100.0

Adjustments to New Locations

As noted earlier (Table 2), 55% of the rural graduates and 40% of the urban graduates had moved one or more times after completing TAT training. Often the moves were to new jobs or work assignments in distant towns and cities. But sometimes only local moves were made in order to be more convenient to work or to improve living situations.

As shown below, relatively few of the rural graduates who had relocated mentioned serious problems associated with such moves.

	Rural graduates	Urban graduates
Number who had relocated at least once since leaving TAT	95	120
Number who did not indicate serious problems related to these moves	68 (72%)	64 (53%)
Number who said major relocation problem was:		
Finding suitable housing	14 (15%)	24 (20%)
Cost of relocation	7 (7%)	18 (15%)
Homesickness	5 (5%)	8 (7%)
From other causes	1 (1%)	6 (5%)

Apparently there had been some reluctance on the part of family members to move from their home surroundings. Asked if they thought their families had wanted to relocate, responses of trainees with dependents who had relocated were as follows:

	Rural graduates	Urban graduates
Believed their families had not wanted to move	18 (45%)	28 (38%)
Believed their families had wanted to move	12 (30%)	34 (46%)
Did not know how family members had really felt	10 (25%)	12 (16%)

Attitudes Toward Future Moves

Those interviewed in the post-placement survey were asked how they felt about relocating in the future.

Eighty-one percent of the rural graduates and 88% of the urban graduates who responded indicated that, if they became unemployed, they would be willing to move to a new community in order to get a dependable job.

Seventy-three percent of the rural graduates and 82% of the urban graduates who responded indicated that they would be willing to move if they had a job but could obtain work elsewhere more closely related to their training specialty.

Among those who gave major reasons for being reluctant to move, the most common explanations were:

	Rural graduates	Urban graduates
	—Number of persons—	
Considerations related to family, children, and friendships	25	24
Insufficient money to move	4	23
Did not want to give up their home or business	14	3

Referring not only to moves to new jobs and places but also to relocation in the same community, the TAT graduates were asked whether they anticipated relocating in the foreseeable future. Many of those who responded—68% of the rural group and 57% of the urban group—did not have such plans. Those who intended to make future moves gave the following major reasons:

	Rural graduates	Urban graduates
	—Number of persons—	
To live in better houses or neighborhoods	28	65
To obtain better jobs	12	9
Family preferences and desires to be near relatives	6	17

How these groups would react when actually confronted with decisions about relocating may be quite different from how they anticipate reacting. But the responses to these questions do suggest that there is considerable readiness among the rural trainees to move if job or family living situations would be improved.

CONCLUSIONS

The overall impression gained from this analysis is that—for the TAT graduates at least—trainees with rural backgrounds have fared and adapted as well as their urban counterparts in industrial employment involving technical skills. It would appear that employers and rural persons need not be unduly apprehensive about prospects for workers from non-urban areas to be successful in such work.

Some rural trainees had initial problems of adjusting to shift work and related aspects of industrial settings, as well as in financing moves to distant places and getting settled. These problems usually resolved themselves in a few weeks. However, this suggests that it may be desirable in vocational training, employment counseling, and job orientation programs to help rural people anticipate and prepare for such adjustments.

Some TAT graduates were reluctant to take jobs that entailed moving away from their home settings. But in the main, the rural group displayed considerable mobility and willingness to relocate if it meant more income or fuller use of skills.

Having some education beyond high school and not shifting jobs often were two characteristics that were associated with higher wage rates among the rural trainees. This reinforces the view that post-high school learning has a payoff. It also suggests the possible importance in rural schools and training programs of encouraging traits and attitudes that lead to job advancement without undue career instability.

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