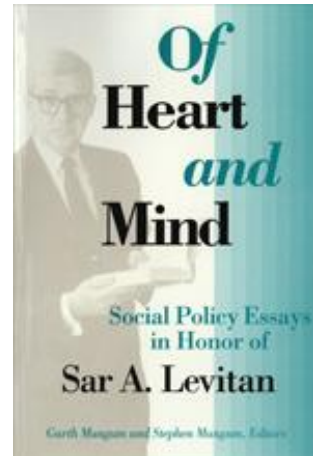W.E. UPJOHN INSTITUTE
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Ethnic Differences in School Departure: Does Youth Employment Promote or Undermine Educational Attainment?

Of
Heart
and
Mind

Social Policy Essays
in Honor of
Sar A. Levitan

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Ethnic Differences in School Departure

Does Youth Employment Promote
or Undermine Educational Attainment?

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Labor demand shifts away from unskilled, blue-collar production jobs in favor of more-educated workers with adequate problem-solving skills have increased the returns to formal schooling and decreased market opportunities for youth. Twenty years ago a high school diploma could ensure youth of a job that paid a family wage, and many dropouts were able to secure some type of low-wage job. In the current economic environment, employment opportunities for youth with low education levels are very limited. Real wages and employment rates have fallen steeply for young, uneducated men, but most especially for disadvantaged and minority youth. Joblessness among minority youth who did not complete high school exceeded 70 percent in 1993 (U.S. DOL 1994c).

Unfortunately, several demonstrations designed to improve the labor market prospects of disadvantaged youth have yielded discouraging results, particularly when compared to the adult outcomes (U.S. GAO 1991, 1993; U.S. DOL 1994a, 1994b). For example, the Supported Work Demonstration produced positive program impacts on adult earnings beyond the period of subsidized employment, but *negative* effects on youth post-program earnings (U.S. DOL 1994c). Similarly, the Summer Training and Education Program (STEP), which included remedial education, life skills, and sex education, as well as traditional summer employment, achieved short-term improvements in the test scores of participants, but no long-term impacts on their rates of school completion, employment or teen pregnancy (Walker and Vilella-Velez

1992). Programs offering close mentoring, role models, and genuine opportunities to exercise and develop personal responsibility have yielded greater successes, but these programs are the exception rather than the rule.

The generally dismal results of youth demonstration programs have rekindled policy interest in dropout prevention programs and school-based work programs that strengthen ties between schools and employers. This idea has long policy antecedents. Adolescent employment has been advocated since 1974, when the President's Science Advisory Committee recommended that high school students acquire work experience to improve their labor market opportunities and to secure a modest degree of autonomy during adolescence. Acquisition of valuable work experience would appear to be especially important for urban minority youth, whose employability and wage prospects have declined precipitously (Kasarda 1995).

Policy proposals to strengthen the transition from school to work by enhancing job opportunities for teenagers who are enrolled in school presume that youth employment does not undermine scholastic achievement (U.S. GAO 1991). Two stylized facts support this idea. One is that employment is pervasive among high school youth: virtually all youth hold at least one job while enrolled in school (Levitan and Gallo 1991a; Ahituv et al. 1994). Conceivably, employment can improve scholastic outcomes if time allocated to work decreases unproductive leisure activities while improving the efficiency of time spent on scholastic tasks (Tienda, Schoenhals, and Schneider 1995; Levitan and Gallo 1991a). Second, there is consensus that early work experience is associated with positive short-term labor market outcomes, as measured by employment and wages at age 25 (Hotz et al. 1995).

Nevertheless, there remains much uncertainty about the educational consequences of adolescent employment, because most studies of the school-to-work transition either ignore employment during periods of school enrollment, or disregard educational outcomes (see reviews in Ahituv et al. 1994; Hotz et al. 1995; Tienda, Schoenhals, and Schneider 1995). Furthermore, there is no compelling evidence that adolescent employment has lasting effects on adult labor force outcomes. Although several studies have concluded that youth employment does not undermine scholastic achievement *provided that time*

allocated to market activities remains well under 20 weekly hours (Levitan and Gallo 1991a; Tienda, Schoenhals, and Schneider 1995), there is less certainty about the school disincentive effects of employment for minority youth whose home environments frequently lack support for academic pursuits.

The high rates of premature school withdrawal among youth aged 16 to 24 (ranging from 8 to 29 percent in 1992 according to the National Center for Education Statistics) suggest the testable and policy-relevant hypothesis that the educational consequences of youth employment are not negligible, as previously claimed. Accordingly, we examine patterns of school departure among white, black, and Hispanic male youth to determine whether, and under what conditions, adolescent employment may precipitate early school withdrawal. We are particularly interested in the effects of adolescent employment on school continuation and withdrawal decisions. Specifically, we evaluate the influence of average weekly hours worked on the odds of remaining in school at specific ages for minority and nonminority youth.

The following section frames our empirical analysis by summarizing some recent trends in youth labor market prospects and describing the data analyzed. This is followed by a description of the variation in school attendance and employment patterns of white, black and Hispanic youth, along with empirical estimates of the schooling consequences of adolescent employment. Results show that the odds of leaving school at ages 17, 18, and 19 increase as the number of weekly hours spent at work rises, but that youth who did *not work at all* also were at higher risk of withdrawing from school at each age. The final section discusses the policy implications of these findings in light of recent changes in youth employment opportunities, lessons about what interventions enhance labor market options of disadvantaged youth, and selected proposals to strengthen the links between school and work.

Data and Variables

We analyze the National Longitudinal Survey of Youth (NLSY), a national probability sample of 12,686 individuals aged 14 to 21 as of

January 1, 1979 who were interviewed annually for over a decade. The original cohort also included oversamples of black, Hispanic, and economically disadvantaged white youth, and an oversample of military enrollees. This analysis focuses on the civilian sample, excluding the oversamples of disadvantaged white youth, but including the over-samples of black and Hispanic youth.[1] Because the retrospective information on school and labor force histories was less complete than the prospective data, we further restrict the sample to men aged 13 to 16 in 1978 to reduce left censoring of schooling careers. Our final sample of 2,553 young men includes 1,253 whites, 793 blacks, and 507 Hispanics.[2]

Most variables presented below are self-explanatory, but our primary dependent variable—school enrollment—and key independent variable—work activity—warrant further elaboration. We define school enrollment status using monthly data, and consider students to have withdrawn from school if they were not enrolled for six months in a calendar year.[3] Measures of work activity are derived from a prospective employment history based on weekly time units. The NLSY contains several indicators of time at work, including hours worked last week; average hours worked in the main job last year; and total hours worked last year in all jobs (calculated by NLSY). Respondents were also queried about the number of weeks spent at work in each year.

We hypothesize that two aspects of youth employment activity may influence school continuation decisions, namely the intensity and the duration of time spent at work. Therefore, we compute two indicators of adolescent employment: percent of time (in weeks) worked during high school and average weekly hours worked by grade level and by specific ages. Average weekly hours was computed by dividing annual hours by annual weeks worked.[4]

A vast literature has established that family background, notably parental education, family income and fathers' occupational status, is the most significant factor influencing the educational outcomes of youth. Summarily stated, well-educated parents have the knowledge, financial resources, and values conducive to positive school performance. For parsimony in presenting the tabular results, we use mothers' educational attainment as the key indicator of family background to designate advantaged and disadvantaged youth. Although both household income and parental education are important predictors of a

child's educational attainment, there is no obvious way to combine these socioeconomic indicators. Use of mothers education provides a clear measure of educational disadvantage, which is central to our substantive concern. The multivariate analyses include two additional measures of family background: family income and headship structure.[5]

Results

Table 1 summarizes race and ethnic differences in educational and employment experiences of young men according to mothers' education (our proxy for disadvantage). As expected, youth from advantaged backgrounds were more likely to graduate from high school by age 18 than their age counterparts whose mothers did not complete secondary school. Among advantaged youth, whites were more likely to graduate than minorities. However, among disadvantaged youth, blacks were more likely to graduate than either white or Hispanic youth. This generalization obtains through age 20, whether or not GED recipients are included among high school graduates. By age 20 we find that 68 percent of disadvantaged black youth completed secondary school or received a GED, compared to 62 percent of disadvantaged white youth, and only 60 percent of disadvantaged Hispanic youth. This result reflects the dramatic educational progress of disadvantaged blacks since 1960 (Mare 1995). White youth, who are less likely to be disadvantaged than blacks, are significantly more likely to graduate than minority youth. A comparison of rows 1 and 2 provides strong evidence of age-grade delay for minority youth.

About 7 percent of Hispanic youth graduate from high school between the ages of 18 and 20, compared with only 3 percent of white youth. Age-grade delay for blacks is even more striking, but larger shares of blacks compared to Hispanics eventually graduate.

As expected, youth from relatively advantaged backgrounds were more likely to attend college than their disadvantaged race and ethnic counterparts. Moreover, white sons of more educated mothers had higher rates of college attendance than their minority counterparts, but Hispanics were more likely to attend college than black sons of high

school graduates. Among disadvantaged youth, blacks and Hispanics were more likely to attend college than their white counterparts. This finding has been documented elsewhere (Hauser and Phang 1993; Stevenson et al. 1993), but no satisfactory explanation has been provided. These race and ethnic differentials in college attendance of disadvantaged youth may result from advantages associated with affirmative action and preferential admission of promising minority students.

Table 1. Educational and Early Work Experiences of Minority and Nonminority Youth by Mother's High School Graduation Status (Means or Percents)

	White		Black		Hispanic	
	Mom HS+	Mom <HS	Mom HS+	Mom <HS	Mom HS+	Mom <HS
H.S. grads, age 18	79.6	49.7	65.4	50.5	60.2	41.1
H.S. grads, age 20[a]	81.1	53.0	69.6	60.3	66.2	48.8
GED, age 20	6.1	8.7	9.5	7.6	10.0	10.8
Attended college, age 20	45.2	10.3	32.9	14.7	38.5	14.2
Ever worked during H.S.	73.9	71.7	65.6	65.2	68.1	68.8
Time (weeks) worked before age 18, H.S. grad[c]	37.1	34.8	22.1	24.2	33.2	27.5
Time (weeks) worked before age 18, H.S. dropout[c]	28.5	28.4	23.4	22.6	27.2	24.2
[N][b]	[896]	[302]	[350]	[370]	[133]	[326]

a Excludes GED
b. N's computed for age 18
c. These variables were constructed from weeks worked using the work history file

Table 1 also shows that variation in youth employment by mother's education and group membership was less pronounced than differences in educational attainment. By age 18, nearly three-in-four white youth had ever worked while enrolled in high school, compared to 65 percent of black and 68 percent of Hispanic youth. From these data it is not obvious whether adolescent employment is associated with persistence in secondary school, because there is no systematic relationship

between the share of time worked during high school, disadvantaged status, and youths' graduation status. For white and to a lesser extent Hispanic youth, graduates worked more weeks by age 18 than their counterparts who dropped out of high school, but for black youth there were only trivial differences in weeks worked by age 18 between those who graduated from high school and those who did not.

Of course, it is impossible to establish any causal relationship from the cross-sectional tabulations because total number of weeks worked do not indicate the weekly intensity of work effort. Table 2, which summarizes mean hours worked during 9th, 10th, and 11th grades for minority and nonminority youth according to eventual graduation status provides some insight into this matter.

Table 2. Labor Market Activity During High School: Average Hours Worked during High School According to Mother's Education

Student grade by mother's education	Student graduation status					
	White		Black		Hispanic	
	Grad[a]	Never grad	Grad	Never grad	Grad	Never grad
Mother<HS						
9th graders	3.4	12.3	6.7	9.1	6.1	6.6
	(9.3)	(18.0)	(13.1)	(15.4)	(13.2)	(15.2)
10th graders	10.8	13.9	12.5	18.4	15.3	17.8
	(13.4)	(17.2)	(15.9)	(16.3)	(17.8)	(18.4)
11th graders	18.7	19.1	16.0	20.3	20.7	22.2
	(15.1)	(16.1)	(14.8)	(15.2)	(16.7)	(18.3)
Mother HS +						
9th graders	2.2	4.3	2.6	5.0	3.4	7.8
	(7.9)	(11.3)	(9.0)	(11.1)	(10.1)	(17.1)
10th graders	11.7	13.7	10.0	11.6	13.6	10.8
	(14.1)	(17.1)	(15.1)	(14.5)	(15.6)	(14.7)
11th graders	20.3	22.8	17.0	17.9	20.8	32.8
	(13.7)	(14.6)	(15.2)	(16.8)	(15.0)	(19.1)

a Excludes GED recipients

First, with only one exception (Hispanics whose mothers were high school graduates), dropouts averaged more weekly work hours prior to

12th grade than their socioeconomic counterparts who finished high school. This result differs from table 1, which shows that dropouts work fewer weeks than graduates and points to the significance of work intensity as a mechanism precipitating premature school withdrawal. This supports the view that working too many hours has deleterious educational consequences (Levitan and Gallo 1991a; Tienda et al. 1995). Second, the pattern of excessive work commitment that we hypothesize eventuates in premature school withdrawal begins early in the high school career. For example, the average hours disadvantaged white dropouts worked during 9th grade far exceeded those of their race counterparts who did eventually graduate (12.3 vs. 3.4). Similar patterns obtain for black and Hispanic youth, although the differentials for blacks arise among 10th graders, and for Hispanics they are less pronounced. Third, race and ethnic differences in the association between high school graduation status, work effort and grade progression are more pronounced among disadvantaged compared to advantaged youth. From these tabulations we draw two inferences. One is that the "detrimental" work level may be less than 20 weekly hours. Another is that the 11th grade may be a particularly vulnerable point in an adolescent's school career, because it represents the first real choice between school and work for students who are not age-grade delayed.

These descriptive results are consistent with our hypothesis that adolescent employment can lower educational achievement by accelerating the odds of school withdrawal. However, it is impossible to ascertain from the tabular results whether educational consequences of adolescent employment differ by race and Hispanic origin because the observed group differences may simply reflect underlying socioeconomic inequities between minority and nonminority groups. Therefore, we turn to our multivariate analysis to examine this hypothesis further.

Multivariate Analyses

Our approach to school departure considers four sets of factors known to influence these decisions: (1) *family background,* notably household income, parental education, and family headship (i.e., whether raised by one or two and parents);[6] (2) *scholastic aptitude*, depicted by respondents' (age-adjusted) AFQT score at the time of the first interview;[7] (3) *ascribed traits* (race and national origin; birthplace,

and age cohort) that are correlated with school and employment out-comes;[8] and (4) *work behavior*, average weekly hours during the previ-ous year. The dependent variable is coded 1 if respondents did not withdraw from school at specific ages (i = 16, 17, 18 and 19) and 0 oth-erwise.

Our empirical model represents a reduced form specification of fac-tors influencing the decision to persist or withdraw from school at spe-cific ages. All variables included in the analysis are presumed to be predetermined and exogenous to the choices made at any point in the life cycle. We estimated two models of school continuation for specific ages—one which included all youth, and another which was restricted to youth who were enrolled in school the previous year. The latter essentially focuses on recent dropouts.[9] That empirical estimates were qualitatively similar inspires confidence in the robustness of our esti-mates. Therefore table 3 presents the results of the final probit models predicting school persistence at specific ages. In the interest of parsi-mony, we restrict our discussion to variables of central interest, namely minority group status and work activity.

The main effects on school persistence of minority group member-ship and work effort are of great substantive interest. Although the tab-ular results showed that black youth were less likely to graduate from high school than their white counterparts, these differences largely reflect differences in socioeconomic background (family income, parental education, and AFQT scores. In fact, given their background characteristics, black youth are less likely to withdraw from school between ages 16 to 19 than statistically comparable whites. Similarly, Hispanic youth are no more likely to withdraw from school at ages 16 and 17 than white youth who share their individual and family charac-teristics. Rather, Hispanics are more likely to persist in school at ages 18 and 19 than statistically similar white youth (see also Hauser and Phang 1993).

These findings corroborate those of other studies showing that race and ethnic differentials in dropout status largely reflect variation in family socioeconomic background (Hauser and Phang 1993, among others). In other words, group differences in socioeconomic composi-tion are responsible for average differences in dropout rates of minority and nonminority youth. Nevertheless, the *higher* school persistence rates of minority youth relative to statistically equivalent whites beg for

Table 3. Probit Estimates of School Persistence at Specific Ages[a]
(Asymptotic standard errors)

Variables	Age 16	Age 17	Age 18	Age 19
Hispanic	.237	-.115	.231**	.330**
	(.177)	(.111)	(.085)	(.094)
Black	.577**	.494**	.349**	.384**
	(.162)	(.104)	(.072)	(.081)
Foreign born	-.120	-.016	.153	.230
	(.232)	(.162)	(.123)	(.134)
Age 14 in 1978	.033	-.192*	.019	.024
	(.124)	(.097)	(.079)	(.086)
Age 15 in 1978	b	-.057	-.010	-.103
		(.114)	(.080)	(.087)
Age 16 in 1978	b	b	.096	.024
			(.079)	(.088)
AFQT test score	.025**	.019**	.011**	.019**
	(.004)	(.002)	(.002)	(.002)
Missing AFQT test scores	-.340	-.058	.153	.936**
	(.321)	(.237)	(.184)	(.225)
Family income in 1979 ($ in 1000)	.021*	.012**	.014**	.013**
	(.008)	(.005)	(.003)	(.003)
Missing family income information	.116	.222°	.343**	.251**
	(.195)	(.124)	(.086)	(.093)
Highest grade completed by respondent's mother	.042	.006	.038**	.042**
	(.023)	(.014)	(.011)	(.012)
Missing information about mother's education	.251	.026	.239	.245
	(.291)	(.197)	(.151)	(.178)
In female headed household at age 14	-.126	-.205*	-.047	.077
	(.151)	(.095)	(.071)	(.080)
Average weekly hours worked last year	-.025	-.022**	-.011**	-.022**
	(.020)	(.005)	(.002)	(.003)
Did not work last year	.032	-.504**	-.162	-.476**
	(.626)	(188)	(.091)	(.106)
Constant	-.668	.291	-.992**	- 1.799**
	(.689)	(.273)	(.169)	(.194)
[N]	[1184]	[1850]	[2407]	[2155]

a. Conditioned on school enrollment during previous years
b. Not included in the model
*Significant at 10 percent level.
**Significant at 5 percent level

an explanation of the race and ethnic differentials in school continuation because they have implications for the design of employment and training policy that builds on the human capital potential of disadvantaged youth.

Our major interest is in the effects of youth employment on school continuation decisions. We consider two measures of work effort: no work activity and average weekly hours worked during the previous year.[10] Two striking results emerge. First, youth who have no attachment to the labor market are significantly more likely to withdraw from school at ages 17 through 19. This finding provides some support for current policy initiatives that recommend employment as a way of strengthening the connection between school and work, and particularly for disadvantaged youth. However, a second result tempers this conclusion. The strong negative effects for ages 17, 18 and 19 of average weekly hours indicates that excessive commitment to work during adolescence increases the likelihood of premature withdrawal and also lowers the odds of continued education beyond secondary school. Both results have important implications for the design of school-to-work transition programs that have gained popularity in the current administration.

Because the tabular results imply race and ethnic differences in both graduation rates and employment activity, we estimated age-specific probit models predicting persistence in school that included interactions between minority status and weekly hours. This was done to ascertain whether the employment effects on school continuation decisions differed among Hispanic, black and white youth. Virtually all interaction effects were statistically insignificant, therefore we reject the hypothesis that youth employment effects on school withdrawal differ among demographic groups.

The probit coefficients do not lend themselves to direct comparisons across groups from differing backgrounds. Therefore, we estimated the elasticities of school persistence implied by the average hours coefficients. These calculations are reported in table 4 by age, minority group membership and mother's education status. Each entry indicates the percent change in the probability of remaining in school that is associated with a percentage change in the average weekly hours worked in the previous year.

Three noteworthy lessons emerge. First, school continuation decisions of disadvantaged youth are more sensitive to the variation in hours worked than are decisions of nondisadvantaged youth. For example, each percent increase in weekly hours lowers the probability of school continuation by 5.6 percent for 17-year-olds whose mothers had not completed secondary school compared to 3.4 percent for 17-year-olds whose mothers were high school graduates. This generalization obtains for all race and ethnic groups, although the magnitudes of the elasticities differ along race and ethnic lines, which points to a second major lesson. School continuation decisions of disadvantaged Hispanic youth are more sensitive to changes in hours spent at work relative to white or black youth. However, black school continuation decisions are less sensitive to changes in labor supply than those of whites, irrespective of class background.

Table 4. Estimated Elasticities of Average Weekly Hours on School Persistence

	Age			
	16	**17**	**18**	**19**
Mother graduate from HS				
All	-.001	-.034	-.139	-.661
Hispanic	0	-.038	-.172	-.846
Black	-.002	-.032	-.112	-.543
White	-.002	-.033	-.145	-.682
Mother less than HS				
All	-.009	-.056	-.180	-1.403
Hispanic	-.015	-.081	-.193	-1.441
Black	-.002	-.041	-.152	-1.300
White	-.009	-.050	-.202	-1.508

Third, the disincentive effects of adolescent employment on school continuation are quite large for age 19, which represents the transition from secondary to post-secondary schooling for kids who are not age-grade delayed.[11] Our results imply that the work effort of 18-year-olds lowers the probability of continuing to college by 66 percent for youth whose mothers graduated from high school, and by 140 percent for those whose mothers were dropouts. Given the rising returns to school-

ing during the past fifteen years, these results portend substantial race and ethnic income inequality for young workers in the future unless employment and training policy can increase incentives of youth to complete high school, and encourage larger shares of minority youth to pursue postsecondary training.

Conclusions and Policy Implications

The Clinton administration, under the direction of Labor Secretary Robert Reich, has acknowledged the plight of disadvantaged youth, particularly those needing a second chance to acquire work-relevant skills. Calls for youth apprenticeship programs and new partnerships between labor and education leaders explicitly recognize that the United States lacks a system to facilitate the transition from school to work for noncollege-bound youth. Growing employment and wage differentials between high school graduates and dropouts, and between college- and noncollege-educated youth increase the urgency of improving high school graduation rates as a strategy to *prevent* economic hardship among adults. Yet dropout rates remain alarmingly high. The National Center for Education Statistics reported dropout rates of 8 percent for white, 14 percent for black, and 29 percent for Hispanic youth in 1992.

A popular proposal to lower dropout rates entails a revival of work programs that allow youth to acquire work experience as they complete their formal schooling. The presumption, of course, is that job experience is valuable in socializing youth to the world of work, and that employment helps youth envision connections between academic subjects and the skill requirements of jobs. Our findings showing deleterious effects of work intensity on decisions to persist in school lead us to question conventional wisdom about the educational consequences of youth employment.

Of course, spending large amounts of time in low-wage work while enrolled in school does not mean that a well-designed school-to-work program that integrates school-based and work-based learning will not be productive. In fact, our results showing that youth who do not work at all are at extremely high risk of dropping out of school warrant spe-

cial consideration. These youth pose the greatest challenges for employment and training policy, and *should* be the target of school-based work programs that provide strong and clear links between academic subjects and concrete work activities. A well-conceived academy program should incorporate industry-specific training in basic curricula, and should include job guarantees for satisfactory performance. To be successful, these programs must begin well *before* the legal age for youth to withdraw from school, and hopefully can be enhanced with mentoring activities during early adolescence.

This raises a second policy issue, namely, the legal age to withdraw from school. The future labor market has little room for high school dropouts, at a time when graduates are facing income insecurity. Given recent wage trends for skilled and unskilled workers, it seems reasonable to raise the legal limit to withdraw from school from age 16 to age 18. This change would make the greatest difference for Hispanics, who currently experience the highest rates of school withdrawal. A corollary of this proposition is that enrolled youth should be legally prohibited from working above 15 hours weekly, which is the level several studies deem inconsequential for scholastic outcomes.

A third policy implication of our results concerns the meaning of race and ethnic differences in the educational consequences of adolescent employment. We do not believe group-specific programs are warranted. However, our results showing different elasticities for Hispanic and disadvantaged youth indicate that program emphases should be tailored accordingly. Specifically, for Hispanic youth, employment and training programs would be maximally effective by focusing on school retention and school-based learning. Our results clearly show that youth whose parents have very low levels of education are at extremely high risk of premature school withdrawal. Therefore, the special needs of disadvantaged youth, including provision of remedial skills and work experiences that are tightly linked to school-based learning, should be a priority for future youth employment training programs.

The most concrete recommendation that encompasses all three policy issues derives from Sar Levitan's writings, which appropriately complain that the current training system is ill-equipped to prepare noncollege-bound youth for the workforce of the twenty-first century (Levitan and Gallo 1991a, 1991b). In several of his last papers, many co-authored with Frank Gallo, Levitan proposed "tech-prep" as the

best solution to prepare noncollege-bound youth to pursue technical occupations (see Levitan, Mangum, and Mangum 1993; Levitan and Gallo 1993). Their conception of tech-prep is that training will begin during the last two years of high school (with no major loss if students switch preferences) and continue for an additional two years in a community or technical college. To be successful with "hard-to-reach" disadvantaged youth, tech-prep programs must include incentives for successful completion of the program (i.e., nontrivial wage increases and guaranteed jobs, which requires strong ties between schools and businesses). The U.S. Department of Labor (1994c) has identified several successful programs that embody these principles. What is lacking is the political will to bring them to fruition.

NOTES

1 This decision was based on extensive diagnostic analyses that revealed significant differences between the white random and nonrandom samples, but relatively minor differences between the Hispanic and black oversamples (see Ahituv et al. 1994) Descriptive statistics are appropriately weighted to approximate population parameters, thus the decision to include the minority oversamples does not distort statistical inferences

2 These samples represent the full-risk set at the beginning of the panel, i e , in 1979 Sample sizes vary for specific analyses owing to differential attrition and randomly missing date We have conducted extensive sensitivity tests to ensure the randomness of the missing data and include appropriate controls in all instances where missing data were not ignorable.

3. We experimented with various definitions of school enrollment, both more and less restrictive, and obtained similar results

4. We conducted sensitivity tests to determine whether our findings varied according to the measure of work effort used Our results are quite robust, as they are similar for all measures of work effort

5 We opted to use mother's educational attainment rather than that of fathers because there was less missing data for this indicator, partly because of the share of families with an absent father When mother's education was missing, we substituted father's education Owing to assortive mating, results are substantively similar using either measure

6 Because each of these variables had high levels of missing data due to nonresponse, we constructed companion variables to flag missing data. This strategy has the twin advantages of avoiding unnecessary loss of sample observations and monitoring the selectivity of nonresponses

7. The Armed Forces Qualification Test, or AFQT, is the sum of the scores on four of the 10 subtests in the ASVAB· the Work Knowledge, Paragraph Comprehension, Arithmetic Reasoning and Mathematics Knowledge subtests The military interprets the AFQT score as a measure of general trainability, and uses the scores to screen out individuals who are likely to have a low probability of successfully completing military training. Labor economists have used the AFQT as an indicator of general ability, arguing that it performs like an aptitude test.

8 Respondent's age in 1978 (or age cohort) serves as a control for left-hand censoring of the school and work histories

9 We conducted sensitivity tests using alternative definitions of school withdrawal, namely nonenrolled for six and twelve months, and obtained similar results. We also compared estimates of models conditioned on being enrolled in the previous year and unrestricted by prior enrollment status to determine if re-enrollment patterns influenced our results Conclusions were fundamentally unchanged because of the low incidence of re-enrollment

10 Our measure includes summer employment, but the vast majority of job spells occurred during the academic year It is very difficult to separate summer and academic year employment because most work episodes cross boundaries. Furthermore, NLSY lacks precise information .about the timing of school withdrawal, which makes this distinction less critical analytically.

11 Because many youth are still enrolled in high school at age 19, our estimates for this age confound late graduation with college entry. They are, therefore, conservative

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