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ABSTRACT

A study was conducted to determine the effect of participation in vocational education on labor market experience immediately after high school. Data were gathered in March and April of 1980 while the young people were seniors in high school, and again two years later. The first wave of data contained various measures of education and grades in school, participation in extracurricular activities, family background, work attitudes, career aspirations, and test scores. The second wave contained a complete history of jobs held since 1980 and post high school educational experiences and earnings. Three measures of the respondents' labor market success--earnings in 1981, number of months in which the respondent worked in the period between June 1980 and February 1982, and average hourly wage rates during that 21-month period--were defined from the second wave interviews. Data were gathered on a subsample of 1,712 for earnings in 1981 and number of total months, and of 1,256 for wage rates from a total of 12,000 persons on whom longitudinal data were available. Some of the results were the following: (1) males earned an additional $1,800 per year, worked an additional 1.4 months, and got paid 70 cents more per hour than females; (2) the positive impact of vocational coursework on wage rates and earnings was larger for men than for women; (3) trade and technical or other vocational courses had a large positive effect on the wage rates and earnings of men but almost no effect on those of women; and (4) the only type of vocational training that seemed to yield a significant immediate economic return to women was business and sales. The study also found that higher mathematics test scores increased the earnings of women but not of men, while high vocabulary test scores had the opposite effect. (KC)

THE EFFECT OF CURRICULUM ON LABOR MARKET SUCCESS IMMEDIATELY AFTER HIGH SCHOOL

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The Effect of Curriculum on Labro Market Success Immediately After High-School

A number of blue ribbon panels have called for the reform of America's secondary schools. In marshalling support for reforms, many of the blue ribbon panels have cited the need to improve the productivity of the work force in order to regain a competitive edge in international markets.

Excellence in secondary education can improve the productivity of the nations work force in at least four ways:

- o By insuring that every young person obtains functional literacy--some minimum level of basic skills.
- o By improving the quality of the academic preparation of young people (especially for the two thirds of high school graduates planning to attend college).
- o By improving the vocational preparation of young people (especially of high school drop outs and the one third of high school graduates that do not attend college).
- o By improving the employability skills (career selection, job search work habits, etc.) of young people.

One of the recommendations that has often appeared in these reports is for increases in the number of courses in English, mathematics, science and social science required for graduation from high school. Many states and local school systems have adopted these recommendations. The Nation at Risk report also recommended that there be increases in the length of the school day and the school year. Very few states have been willing, however, to budget the extra money necessary to pay for significant increases in the school day and/or the school year. With the amount of time a student spends in school remaining constant, an increase in number of required courses in the new basics must produce a reduction in the time spent in some other activity. Which other activities should be reduced? Should the reduction be made in study halls, extra curricular activities scheduled during school hours, music

and fine arts, physical education, life skills courses or in vocational education? The answer to this question will not be the same for every student in the school? The one third of high school graduates who do not want to go to college and plan to work immediately after graduating probably have very different feelings about this than the student who aspires to being an artist. How should students be advised? How should schools allocate their own resources between the different subject area? The Nation at Risk report proposes that the productivity of the future work force be one of the criteria for making these judgements. The three best indicators of an individual's economic productivity are the wage rates, earnings and employment. Consequently it will be useful to know how the choice of curriculum (which subjects a student chooses to study during high school) influences these outcomes. In this paper we will focus on the appropriate balance between academic and vocational education.

There have been many studies of the impact of high school vocational education on labor market success of its former students. These studies have tended to find that vocational education has a large economic payoff for women but a much smaller and often negative payoff for men.

Meyer found, for instance, that for males, specializing in the trade and industry area had a statistically significant positive effect only in the year immediately following their graduation from high school. Gustman and Steinmeier (1981), Mertens and Gardner (1981) reported hourly earnings disadvantages for male business specialists, advantages for marketing special lists, and mixed results for trade and industry specialists. Rumberger and Daymont (1982) found that additional vocational credits were associated with higher hourly earnings if the credit was earned in a program that had provided skills that were being used on the respondent's job. Additional credits in

vocational courses that were not related to the job reduced hourly earnings. However the estimated effects of job-related courses were not significantly different from zero whether the vocational course work was expressed as total credits or as a proportion of total courses taken. The effect of secondary vocational education on the hourly or weekly earnings of women in commercial or office specialties is more consistently and significantly positive. Grasso and Shea, Meyer, Grustman and Steinmeier, Mertens and Gardner, Campbell et al. and Rumberger and Daymont all reported significantly higher earnings for women who took vocational courses in the business/office area with various data sets.

Another line of approach follows the second point, the behavioral analysis (Gardner et al. Gustman and Steinmeier). We know so little about the skills produced by high school vocational training that we can not say how broad it is or how costly it is in terms of lost opportunity of learning basic skills. However we see many possible routes through which vocational education exerts on direct labor market outcomes (wage rate, labor force participation). For instance vocational education may affect earnings and employment by influencing the efficiency of a person's job search and application process. Students in vocational training can narrow the focus of the job search. Also students may also learn where and how to find job openings.

Vocational education is expected to affect direct market outcomes through its impact on a student's job search, educational attainment, labor market experience, job tenure, occuaptional choice, industry of employment, unionization, fringe benefits, job safety and frequency of various types of job separation.

The empirical results for male vocational graduates by Gardner et al. is vocational education increases job tenure, work experience and the probability

of obtaining work in industries with high paying jobs. But it is also associated with fewer years of educational attainment and nonunionized jobs.

Secondary vocational education reduces educational attainment more for women. However, vocational education is apparently more successful for women than for men in directing its students into industries and occupations that are well paid and there is no tendency for women vocational graduates to be less likely to be in unionized jobs.

Relative advantages in annual earnings for vocational graduates are attributable to longer average hours worked and to a higher average number of weeks worked per year. The longer average job tenure for vocational graduate and their more frequent tendency to be full-time labor force participants suggest a firmer attachment and a more stable pattern of labor market involvement.

In sum there is a great variation within the secondary vocational education. This line of approach is improtant and useful because it identifies sources with positive or negative effects that suggest directions for policy and future research.

All the results above give biased view if self-selection problem is not completely handled.

1. DATA

Longitudinal data on the 1980 high school seniors at High School and Beyond (HSB) high schools will be analyzed. The first wave of data collection occurred in March/April of 1980 while the young people were seniors in high school. The second wave of data collection was conducted in the spring of 1982 nearly two years after graduation from high school. The first wave contains various measures of education and grades in school, non academic activities such as participation in extracurricular activities, and work experience, as well as students' family background, attitudes toward work and career aspirations. Also, at the time of the first wave survey all respondents took standardized tests on three subjects, mathematics, reading, and vocabulary. These tests provide measures of the level of the basic skills which are comparable across respondents. The second wave contains a complete history of jobs held since 1980 and post high school educational experiences and earnings. Three measures of the respondents' labor markets success--earnings in 1981, number of months in which the respondent worked in the period between June 1980 and February 1982, and average hourly wage rates during the 21 month period--were defined from the second wave interview.

Longitudinal data is available on a total of about 12,000 seniors. The subsample of this group was selected for this study by applying the following criteria. Respondents had to have:

1. Graduated or left high school in May or June 1980.
2. Not attended school or college full time at anythime between June 80 to February 82.
3. Not married.
4. Not been in active military service or military reserve.

After selection criteria reduce the total number of observations to 1712 for earnings in 81 and number of total months and to 1256 for wage rates.[1]

We expect that the major activity of the sample is to participate in labor market and that their experience in school and other socio-economic background will influence their success in labor market.

The labor market outcomes examined in the study are 1981 earnings; the number of months in which the individual worked between June 1980 and February 1982, and the average hourly wage rate during that period.[2] These variables measure the labor market experiences that immediately follow high school graduation. The study focuses on how these measures of early labor market success are influenced by the selection of courses in high school and by performance in the courses selected. Data on what the youth studied in high school was obtained by asking the student to report how many years of courses he or she took in each of the following fields: mathematics, English or literature, French, German, Spanish, history or social science, science, business or sales, trade-industry, technical and other vocational. In the analysis the foreign languages are aggregated together and technical vocational programs are combined with trade and industrial. The resulting list of variables describing the students curriculum is as follows:

Years of courses taken

Academic courses

1. Mathematics
2. English
3. Foreign language
4. History/Social Science
5. Science

Vocational courses

6. Business/Sales
7. Trade/Industrial and Technical
8. Other vocational courses

Participation in educational programs (dummy variables)

1. Cooporative education
2. Work-study
3. Talent search
4. CETA work

Grades and Test Scores

1. Received mostly A's or B's in business/office courses
2. Received mostly A's or B's in other vocational courses
3. Mathematics standardized test scores
4. Readings standardized test scores
5. Vocabulary standardized test scores

In addition to these explanatory variables we included the variables measuring respondents' socio-economic and personal characteristics in the following categories.

- o Geographic region
- o sex, race, ethnicity, age
- o family background
- o value scores and attitudes toward work
- o habits, school life
- o work experience while in high school
- o extracurricular activities
- o part-time student status

Detailed list of variables in these categories are given in the appendix.

Table 1 presents sample means and standard deviations of the variables for males and females separately and for the full sample.

Mean earnings in 1981 for the whole samples was $5407. On the average they were employed 12.6 months during 21 month period between June 80 and February 82, and their average hourly wage during that period was $4.24. In all three categories of labor market outcomes, males did better than females. Males earn an additional $1,800 per year, work an additional 1.4 months, and get paid 70 cents more per hour than females.

Male and female high school graduates take similar numbers of courses in math, English, history, and science. The young women are more likely to study a foreign language and to take courses in business and office education. They average 1.4 years of business office education while young men average only .6 years. Young men take an average of 1.58 years of trade, industrial and technical courses while women are taking only .3 years on average. There is

quite a lot of variation in the amount of trade and technical coursework taken by men. The standard deviation of years taken is 1.75.

2. RESULTS

The three labor market outcomes examined in the study are earnings in 1981, number of months in which the individual worked between June 1980 through February 1982, and average hourly wage rate during the period. These indicators of labor market success are regressed on the following explanatory variables: years of coursework taken in various academic and vocational areas, grades in vocational courses (business/office, and other vocational courses), and scores on standardized tests (mathematics, reading, and vocabulary) and a large group of control variables. The control variables included: region, residence in a suburb, rural, demographic characteristics, physical handicaps, family background, scales measuring self esteem, locus of control, work orientation, family orientation, community orientation, church attendance, school attendance, reading for pleasure, homework, deportment participation in extra curricular activities, and previous work experience.

Sex Differences

For each dependent variable the equations were estimated for subsamples consisting of males only and females only, and ~~both male and female~~ for the full sample containing both sexes with a dummy variable for gender. The T-test of the gender dummy variable in the pooled regression suggests that the coefficients for gender dummy are significantly different from zero at far below 1 percent level in earnings and wage rates and 5 percent level in number of months worked. In order to identify the cause of the lower wage rates and earnings of young women, we tested the

equality of the slope coefficients for males and females. The results of the statistical tests are presented in Table 2.

The differences of slope coefficients are insignificant at 5 percent level for total months worked, and significant at 5 percent level for earnings in 81, and average hourly wage but they are insignificant at 1 percent level for both equations. Thus, there seem to be statistically significant sex differences in the structure of wage and earnings determination process but not in the determination of months worked.

Consequently results will be presented both for a pooled model and for each sex separately. The pooled model results are presented in Table 3. Models estimated in samples limited to just one sex are presented in Table 4 through 6.

Effects of the Type of Courses Taken

The top panel of Table 3 presents estimates of how short run (twenty-one months after leaving high school) labor market outcomes are influenced by the types of courses taken in 10th, 11th and 12 grade. The pattern of results is remarkably consistant. For those who do not enter college full time, become married or enter the military, short run labor market success seems to be associated with taking vocational rather than academic courses in high school. All nine of the coefficients on vocational coursework were positive. Years of trade and technical coursework had a statistically significant positive impact on all three outcome measures. Vocational courses in the business, office and sales area seem to have a highly significant impact on months worked and other vocational courses seem to produce a significant increase in earnings. Ten of the fifteen coefficients on academic coursework

were negative. History and social science had a statistically significant negative affect on the wage rate and science and foreign languages had statistically significant negative impacts on earnings. The estimated effect of mathematics on wage rates and earnings is very close to zero. Of all the academic subjects English seems to have the most positive effect. The coefficients on wage rate and earnings are of reasonable size but are only slightly larger than their standard errors.

The regression coefficients predict that a student who substitutes 2 years of trade and technical coursework for 2 years of academic coursework (distributed equally math, English, foreign languages, social science and science) will obtain a $0.16 higher hourly wage, about 4 percent, will work about 2/3 of a month more (5 percent) and will earn an additional $697 per year (13 percent).[3] If 2 years of business, office and sales training are similarly substituted for 2 years of academic coursework, the regressions predict a $.13 higher wage rate, 1.2 months of additional employment and $615 in high earnings. If two years of other vocational courses are similarly substituted for academic courses, the regressions predict a $0.10 higher ware rate, .7 months of additional employment and $824 in additional earnings.

Dummies were entered into the model for participation in cooperative education, work study, talent search and CETA work experience programs. Two thirds of the coefficients on these variables were negative and none were statistically significant.

Effects of Grades and Performance on Standardized Tests

The short run benefit of studying vocational subjects seems to be even greater if the student gets good grades in the courses. When other things (test scores, personality scales, work orientation scales etc) are held

constant, substituting two years of vocational courses for academic courses and getting A's and B's in them raises predicted earnings by approximately $1000. or nearly 20 percent. While the point estimates imply important positive effects, none of the dummies for receiving good grades in vocational education are statistically significant.

Performance on the HSB vocabulary test is significantly related to months marked and 1981 earnings. A two standard deviation increase in the individuals score on the vocabulary test is associated with an additional 1.4 months worked (11 percent), and an additional $549 of earnings (11 percent). The non significant positive coefficient on the vocabulary test in the wage rate regression implies a wage increase of only $.04 or 1 percent. Neither of the other tests--mathematics and reading--had statistically significant effects on labor market outcomes when entered in competition with the vocabulary test score. What explains the interesting pattern of results: performance on a vocabulary test (not other tests) raises hours worked and earnings but not the wage rate? Since measures of work orientation and tastes for employment are included as controls, the vocabularly test is probably picking up an ability to obtain and keep jobs rather than a taste for work. Perhaps the verbal facility that a high vocabulary test score indicates helps the young person handle job interviews. Another explanation for the vocabulary test outperforming the other tests, is that it is more highly coorelated with IQ and IQ may be the tract that actually determines the individuals ability to get and keep jobs.

Comparing Men and Women

Comparisons of the separate regressions for males and females reveal some interesting interactions between sex and the labor market consequences of

curriculium choice. Calculations were made of the short run labor market effects of taking 2 years of vocational courses and reducing academic coursework by a like amount. These calculations are presented in table 7. The following patterns seem to prevail.

- o The positive impact of vocational coursework on wage rates and earnings is larger for men than for women.
- o Trade and technical or other vocational courses have a large positive effect on the wage rates and earnings of men but almost no effect on the wage rate and earnings of women.
- o Getting good grades in trade, technical or other vocational education has a very large impact on the wage rate and earnings of young men but almost no or a negative effect on the wage rate and earnings of young women.
- o The only type of vocational training that seems to yield a significant immediate economic return to women is business and sales. Coefficients on the business/sales coursework variable are statistically significant in the months worked and earnings regressions. Two years of coursework substituted for a mix of academic courses increases employment by 1.07 months (9 percent), earnings by $837 (20 percent), and wage rates by $.16 (4 percent).
- o Getting good grades in business or sales seems to increase the economic payoff for women even more.
- o Men receive smaller return from business and sales training than women. Two years of such training substituted for an equal mix of academic courses raises the wage rate by $.06 and months worked by 1.1 reduces earnings by $96. if the young man gets A's and B's in these courses the results are more favorable. The regressions predict that wage rate rise by $.09, that months worked increase by 1.8 and earnings increase by $607.

For young men the payoff to taking vocational courses in high school seems to be greater in trade, technical and other vocational courses than in business and sales. For young women the payoff to taking business and sales courses is considerably higher than the payoff in other vocational areas.

There is also an interesting contrast between the sexes in the impact of mathematics, and reading and vocabulary achievement on the amount of time spent working. A simultaneous two standard deviation increase in all three

test scores has a dramatic effect on the number of months worked; during the 20 month period following graduation raises by the increase is 19 percent for men and 24 percent for women. For men it is the vocabulary test that is primarily responsible for the rise in employment. For women the math test is primarily responsible. The pattern in the earnings equations is similar: Vocabulary achievement increases earnings of men but not of women; while mathematics achievement raises the earnings of women but not of men.

TABLE 1

SAMPLE MEANS AND STANDARD DEVIATIONS

	Male Mean (S.D)	Female Mean (S.D)	Both Mean (S.D.)
Earnings in 1981 (dollars)	6,932 (5,600)	4,139 (3,892)	5,407 (4,942)
Number of Months Worked	13.39 (7.46)	12.00 (7.72)	12.63 (7.63)
Average Hourly Wage (dollars/hr)	4.62 (1.60)	3.88 (0.99)	4.24 (1.88)
Years of Courses Taken			
Mathematics	1.881 (.942)	1.712 (.928)	1.789 (.938)
English	2.847 (.712)	2.905 (.665)	2.879 (.687)
Foreign Language	.580 (.951)	.791 (1.015)	.695 (.992)
History, Social Science	2.238 (.859)	2.211 (.832)	2.223 (.844)
Science	1.529 (.890)	1.422 (.874)	1.471 (.883)
Business, Sales	.620 (.837)	1.424 (1.133)	1.059 (1.086)
Trade and Technical	1.582 (1.753)	.301 (.769)	.822 (1.457)
Other Vocational Courses	.710 (1.071)	.601 (.950)	.651 (1.008)
Participation in Educational Programs			
Cooperative Education	.111 (.314)	.129 (.335)	.120 (.325)
Work Study	.182 (.386)	.145 (.352)	.161 (.368)
Talent Search	.034 (.180)	.050 (.219)	.043 (.202)
CETA Work	.127 (.334)	.152 (.359)	.141 (.348)
Grades and Test Scores			
Received Mostly A or B			
Business and Office	.223 (.416)	.441 (.497)	.342 (.474)
Trade and Other Vocational Courses	.376 (.485)	.072 (.258)	.210 (.407)
Standardized Test Scores			
Mathematics	48.92 (10.04)	46.38 (8.84)	47.53 (9.49)
Reading	48.94 (10.58)	46.41 (9.49)	48.65 (10.00)
Vocabulary	48.71 (9.95)	48.28 (9.57)	48.48 (9.74)

TABLE 2

TESTS OF GENDER GAP

Joint Test of Slope Coefficients
(excluding sex dummy)

	Earnings in 1981	Total Months Worked	Average Hourly Wage
F-Value	1.430	1.075	1.324
Degrees of freedom	(70,1571)	(70,1571)	(70,1185)

95% significance point = 1.29
99% significance point = 1.45

Test of Significance, Sex Dummy

	Earnings in 1981	Total Months Worked	Average Hourly Wage
Point	-1865.	-0.951	-0.381
Estimate t-value	-6.28	-2.04	- 4.01
Degrees of freedom	(1641)	(1641)	(1255)

TABLE 3

POOLED REGRESSION
(MALE AND FEMALE)

	Average Hourly Wage		Number of Months Worked		Earnings in 1981	
Years of Courses Taken						
Mathematics	.005	(.045)	-.270	(.217)	- 4.7	(139.1)
English	.079	(.060)	-.175	(.284)	157.9	(181.8)
Foreign Languages	-.053	(0.04)	.170	(.194)	-225.3*	(124.0)
History, Social Science	-.121**	(.047)	-.146	(.229)	-190.8	(146.8)
Science	-.025	(.047)	.026	(.224)	-325.9**	(143.6)
Business, Sales	.043	(.040)	.542***	(.197)	189.7	(126.4)
Trade and Technical	.057*	(.031.	.256*	(.151)	230.9**	(97.0)
Other Vocational Courses	.025	(.036)	.286	(.178)	294.4**	(113.8)
Participation in Educational Program						
Cooperative Education	-.054	(.115)	-.075	(.562)	54.1	(360.0)
Work/Study	-.157	(.102)	.265	(.498)	- 47.3	(319.0)
Talent Search	.022	(.181)	-.137	(.874)	-208.9	(559.9)
CETA Work	-.169	(.108)	-.356	(.517)	406.2	(331.4)
Grades and Test Scores						
Received Mostly A & B In Business/Office	.008	(.089)	.704	(.437)	370.4	(279.7)
Trade and Other Vocational Education	.159	(.108)	-.106	(.525)	358.8	(336.1)
Standardized Test Scores						
Mathematics	-.003	(.005)	.020	(.025)	- 4.8	(16.2)
Reading	.001	(.005)	.034	(.023)	1.1	(14.7)
Vocabulary	.002	(.005)	.072***	(.024)	28.2*	(15.1)
R^2	.158		.175		.226	
F-value (degrees of freedom)	3.317 (71,1255)		6.124 (71,1640)		6.753 (71,1640)	
Number of Observations	1327		1712		1712	

*significant at 10 percent level (both sides)
**significant at 5 percent level (both sides)
***significant at 1 percent level (both sides)

TABLE 4

EARNINGS IN 1981

	Male		Female	
Years of Courses Taken				
Mathematics	235	(255)	-214	(152)
English	171	(318)	204	(206)
Foreign Language	-232	(237)	-179	(133)
History/Social Science	- 66	(264)	-358**	(160)
Science	-487*	(263)	-120	(155)
Business/Office	-248	(278)	285**	(126)
Trade & Technical	292**	(134)	- 68	(173)
Other Vocational Education Courses	546**	(197)	87	(129)
Grades and Test Scores				
Received mostly A's and B's in Business	703	(556)	210	(283)
Trade and other vocation education courses	557	(486)	- 70	(516)
Standardized Test Scores				
Mathematics	- 27	(28)	29	(18)
Reading	0	(26)	9	(16)
Vocabulary	67**	(27)	- 13	(17)
Number of observations	777		935	
R^2	0.179		0.196	
F-value (degrees of freedom)	2.2 (71,706)		4.26 (71,864)	

*significant at 10 percent level (both sides)
**significant at 5 percent level (both sides)
***significant at 1 percent level (both sides)

TABLE 5

TOTAL MONTHS WORKED

	Number of Months Worked			
	Male		Female	
Years of Courses Taken				
Mathematics	-0.191	(0.340)	-0.342	(0.295)
English	-0.201	(0.426)	-0.140	(0.400)
Foreign Language	0.153	(0.316)	0.303	(0.258)
History, Social Science	-0.085	(0.352)	-0.324	(0.311)
Science	0.160	(0.352)	-0.039	(0.350)
Business, Sales	0.518	(0.372)	0.420*	(0.245)
Trade & Technical	0.352**	(0.179)	-0.101	(0.335)
Other Vocational Education Courses	0.379	(0.263)	0.388	(0.250)
Grades and Test Scores				
Received Mostly A's and B's in Business	0.677	(0.743)	0.761	(0.550)
Trade and Other Vocation Education Courses	-0.210	(0.037)	0.318	(1.002)
Standardized Test Scores				
Mathematics	-0.025	(0.037)	0.086**	(0.036)
Reading	0.053	(0.034)	0.023	(0.03[illegible])
Vocabulary	0.099**	(0.036)	0.033	(0.033)
Number of Observations	777		935	
R^2	0.184		0.228	
F-value (degrees of freedom)	2.31 (71,706)		4.99 (71,864)	

*significant at 10 percent level (both sides)
**significant at 5 percent level (both sides)
***significant at 1 percent level (both sides)

TABLE 6

AVERAGE HOURLY WAGE

	Male		Female	
Years of Courses Taken				
Mathematics	0.024	(0.080)	-0.025	(0.051)
English	0.105	(0.105)	0.061	(0.069)
Foreign Language	-0.069	(0.074)	-0.050	(0.044)
History, Social Science	-0.059	(0.081)	-0.192***	(0.052)
Science	-0.030	(0.086)	0.011	(0.051)
Business, Sales	0.022	(0.088)	0.042	(0.041)
Trade & Technical	0.087**	(0.043)	-0.046	(0.056)
Other Vocational Education Courses	0.077	(0.061)	0.001	(0.043)
Grades and Test Scores				
Received Mostly A's and B's in Business	0.029	(0.172)	-0.036	(0.093)
Trade and Other Vocation Education Courses	0.226	(0.159)	-0.075	(0.163)
Standardized Test Scores				
Mathematics	-0.003	(0.009)	-0.005	(0.006)
Reading	-0.002	(0.008)	0.004	(0.005)
Vocabulary	- .004	(0.008)	0.000	(0.006)
Number of Observations	613		714	
R^2	0.189		0.124	
F-value (degrees of freedom)	1.178 (71,542)		1.31 (71,643)	

*significant at 10 percent level (both sides)
**significant at 5 percent level (both sides)
***significant at 1 percent level (both sides)

TABLE 7

IMPACT OF SUBSTITUTING 2 YEARS OF VOCATIONAL COURSEWORK
FOR A MIX OF ACADEMIC COURSES*

	Business and Sales		Trade and Technical		Other Vocational Education	
	Low Grades	A's & B's	Low Grades	A's & B's	Low Grades	A's & B's
Average Hourly Wage						
Men ($4.62)	.06 (1.3%)	.09 (1.9%)	.19 (4.1%)	.41 (8.9%)	.17 (3.7%)	.39 (8.4%)
Women ($3.88)	.16 (4.1%)	.05 (1.3%)	-.01 (-0.3%)	-.09 (-2.[illegible])	.08 (2.1%)	.00 (0.0%)
Months Worked (during 20 month period)						
Men (13.4 months)	1.1 (8.2%)	1.8 (13.4%)	0.7 (5.2%)	0.5 (3.7%)	0.8 (6.0%)	.6 (4.5%)
Women (12.0 months)	1.1 (9.2%)	1.9 (15.8%)	0.0 (0.0%)	0.3 (2.5%)	1.0 (8.3%)	1.3 (10.8%)
Earnings in 1981						
Men ($6,932)	-96 (-1.4%)	607 (8.8%)	736 (10.6%)	1,293 (18.7%)	1,244 (17.9%)	1,800 (26.0%)
Women ($4,139)	837 (20.2%)	1,047 (25.3%)	131 (3.2%)	61 (1.5%)	441 (10.7%)	371 (9.0%)

*These estimates of impacts are calculated by assuming that 2 years of vocational coursework involve a reduction in academic coursework that is spread evenly across mathematics, English, foreign languages, social science and science. Coefficients on these subject areas are averaged then subtracted from the coefficients on the vocational subject, and the result is multiplied by two. This produces the estimate for low grades. To obtain the estimate for 2 years of coursework with A's and B's we add the coefficient on dummy for received A's and B's in the appropriate vocational subject. Numbers in the parentheses are percentile of the sample mean values.

FOOTNOTES

1. See appendix.

2. Since the individual is counted as having worked in a month even if he or she worked for only part of the month or in a part time job, the number of months worked is not the same thing as total hours worked. An average hourly wage rate could not be calculated for about 385 people who did not have a job during the time period or who gave incomplete answers to wage questions in all their reported jobs. In addition wage rates greater than $15.00 an hour or less than $2.00 were assumed to be reporting errors (e.g., waiters not reporting their tips) and so were excluded from the sample.

3. These figures are calculated by multiplying an average of the coefficients for the 5 academic subjects by minus one and adding the result to the coefficient on Trade and Technical and then multiplying by 2.
Av = 2[230.9 - (-4.7 + 157.9 - 225.3 - 190.8 - 325.9)/5]

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APPENDIX

The control variables used in regression analysis are as follows:

Geographic region

- o Dummy variable for suburb
- o Dummy variable for rural (default is urban)
- o 8 dummy variables for 9 census regions, New England, South Atlantic, East South Central, West South Central, East North Central, West North Central, Mountain, and Pacific (default is Mid-Atlantic)

Sex, race, ethnicity, age

- o Dummy for sex (male = 0, female = 1)
- o Race (white = 0, non-white = 1)
- o Hispanic (Hispanic = 1, non-Hispanic = 0)
- o Age (age as of May 1980)
- o presence of physical handicap
- o Graduated from high school

Family background

- o Family income (in thousands)
- o Mother's education (in years)
- o Father's education (in years)
- o Dummy for family income data missing
- o Number of siblings
- o Dummy for "parents know what their kids are doing"

Value scores and attitude toward work

- o Psychological scales for self concept, locus of control, work orientation, family orientation, community orientation
- o Dummy variables for enjoy work for pay, like to work hard in school
- o Church attendance (scale 0 to 1)

Habits and school life

- o Dummy for "read books for pleasure"
- o Dummy for "read news paper"
- o Scale for having difficulty in adjusting to school life
- o Dummy for presence of school disciplinary problem
- o Dummy for occutionary cut classes"
- o Hours spent working on homework per week

Screening of the sample

	numbers excluded	numbers included
number of seniors interviewed in two waves	---	11,995
Screening 1		
o responded to both questionnaires	768	
o left high school in May/June 1980	1,277	
o not a full time student	6,900*	
		4,327
Screening 2		
unmarried until February 1982	850*	
not in military service or reserve	744	
		2,953
Screening 3		
Exclusion by missing values		
o samples used in the estimation of earnings in 1981 and months worked	1,241	1,712
o samples used in the estimation of average hourly wage	1,626	1,327

numbers with * are approximate values

Extracurricular activities

- o 12 scales for participation in extracurricular activity in atheletic club, cheer leaders and pep club, debate and drama club, school band, hobby club, honorary club, school newspaper, subject matter club, student government, vocational club, youth club.

Part-time student status

- o Dummy for part time student after leaving high school

Work experience

- o Number of hours worked for pay per week during senior year
- o Number of hours worked for pay per week during summer of 1979
- o Number of hours worked for pay per week during junior year