School-to-work programs: information from two surveys

Data from the 1996 School Administrator's Survey show that three-fifths of U.S. high schools offer school-to-work programs, while data from the 1997 National Longitudinal Survey show that nearly two-fifths of students participate in such programs; also, public high school students and those who work are more likely to participate in school-to-work programs

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In 1994, the U.S. Congress passed the School-to-Work Opportunities Act providing federally funded grants to the States and to local partnerships of business, government, education, and community organizations to develop "school-to-work systems."[1] The law encouraged the States and their local partners to develop models that would work best for their particular situations. As a result, the features of school-to-work programs often vary from grant to grant and thus are difficult to describe in general terms. The Act did, however, outline three core elements that all school-to-work programs must entail:[2]

- School-based learning, which encompasses rigorous classroom instruction that is linked to workplace experiences and provides students with the information and skills needed to identify and prepare for promising careers;

- Work-based learning, which includes work experience, structured training, and other workplace learning experiences appropriate to students' career interests and linked to school curricula;

- Connecting activities, which are efforts undertaken to help employers and schools forge and maintain links between the school-based and work-based components of school-to-work programs.

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The general goal of the School-to-Work Act is to improve the transitions from school to work for all youths in the United States. The Act points to a "lack of a comprehensive and coherent system to help youths acquire the knowledge, skills, abilities, and information about and access to the labor market that are necessary to make an effective transition from school to work or further education."[3]

In this article, we are interested in studying the extent to which school-to-work programs have been implemented in our Nation's high schools since the Act's passage in 1994, as well as the extent to which high school students are choosing to participate in these programs. To inform our study, we use two promising new data sources. The first, the 1997 National Longitudinal Survey of Youth (NLSY97), provides information obtained directly from students on the extent to which they participated in school-to-work programs. The second source, the 1996 School Administrator's Survey (SAS96), provides information obtained from the schools attended by the NLSY97 interviewees on whether they offered any school-to-work programs. Using these data sources, we examine the prevalence of school-to-work programs from two different perspectives, investigating the kinds of schools offering such programs and the students participating in them.

These data offer several attractive features for our study. First, the two surveys asked about a number of different types of school-to-work

programs, which allows us to analyze both work-based activities and school-based activities. Second, both surveys asked about the same programs and used similar definitions. Third, responses for the schools in the SAS96 can be linked to those for individuals in the NLSY97. Finally, the surveys collected extensive information on the characteristics of the schools and the youths, thus allowing researchers to examine the characteristics of the high schools that offer school-to-work programs as well as the characteristics of the students who participate in them. Ultimately, these data should become an excellent source for studying the effectiveness of school-to-work programs in helping students settle into their careers; currently, however, the available data do not support this line of inquiry.[4]

Data

1996 School Administrator's Survey (SAS96). The National School-to-Work Office sponsored a supplemental data collection effort within the NLSY97 to support their overall research interest in understanding the effectiveness of the School-to-Work Act. As its name suggests, the SAS96 collects administrative data directly from the schools on the extent to which they offer school-to-work programs; it also provides information on the kinds of schools offering these programs. The sample includes all schools with a 12th grade within the primary sampling units[5] of the NLSY97. The survey asked questions on school policy generally and on school-to-work programs in particular, as well as the characteristics of students, teachers, and administrators. The SAS96 questionnaire was mailed to 7,985 schools in September 1996. Of these schools, 595 were excluded because they no longer existed or because they did not have a 12th grade. Of the 7,390 remaining schools, the response rate was about 72 percent.[6]

Table 1 provides descriptive statistics on the 5,253 schools used in the analysis. We focus on characteristics of the school that are related to the quality of the school, as well as characteristics that indicate something about the socioeconomic status of the school's student population. These characteristics include the following: whether the school is private or public; school size; school location; the graduation rate at the school; the percentage of the school's graduates that enroll in a 4-year college; the racial and ethnic composition of the students; and whether or not the school offered a school breakfast program, Title I services,[7] or a dropout prevention program.

Among schools with a 12th grade, 74 percent are public and 26 percent are private.[8] Because public schools tend to be larger than private schools, we defined school-size variables separately for public and private schools. For example, a "small" public school is defined as one with fewer than 750 students, whereas a small private school is one with fewer

Table 1. Descriptive statistics on SAS96 sample of schools with 12th grade		
Characteristic	Unweighted *N*	Weighted percentage
Total	5,253	100.0
Type:		
Public	3,401	73.9
Private	1,852	26.1
Size		
Public:		
Small (fewer than 750 students)	1,680	72.2
Medium (750 to 1,500 students)	1,295	22.6
Large (more than 1,500 students)	426	5.2
Private:		
Small (fewer than 100 students)	818	53.3
Medium (100 to 300 students)	624	34.6
Large (more than 300 students)	410	12.1
Location		
Urban	1,765	20.8
Suburban	2,822	44.4
Rural	571	33.2
High school graduates		
Graduation rates by quartile:		
1st quartile (less than 85 percent)	1,574	29.1
2nd quartile (86 to 94 percent)	1,066	22.8
3rd quartile (94.8 to 97 percent)	1,016	26.6
4th quartile (98 percent or more)	826	21.5
Percent of graduates who attend 4-year college:		
1st quartile (less than 30 percent)	1,073	29.3
2nd quartile (31 to 44 percent)	702	21.0
3rd quartile (45 to 67 percent)	1,133	24.9
4th quartile (68 percent or more)	1,584	24.8
Student body		
Black:		
Less than 25 percent	3,633	83.3
25 to 75 percent	696	12.4
More than 75 percent	265	4.4
Hispanic:		
Less than 25 percent	3,457	89.8
25 to 75 percent	709	9.1
More than 75 percent	166	1.1
School breakfast program		
Yes	2,521	52.3
No	2,732	47.7
Title I		
Yes	1,763	43.1
No	3,490	56.9
Dropout prevention program		
Yes	2,028	42.5
No	3,225	57.5

Note: Missing information on a particular characteristic will result in numbers (*N*s) that do not add up to 5,253. Due to bunching, the percent in each quartile does not necessarily equal 25 percent.

than 100 students. The majority of both public and private schools fall into the smallest size categories.

Among the schools in our study, 44 percent were in suburban areas, 21 percent were in urban areas, and 33 percent were in rural areas. In addition, only 4 percent of schools reported that 75 percent or more of their student body was black, and only 1 percent reported that 75 percent or more of their student body was Hispanic. A sizable number of schools (43 to 52 percent) have school breakfast programs, receive Title I funding, or have a dropout prevention program.

The National Longitudinal Survey of Youth, 1997 (NLSY97). The first round of the NLSY97 was administered in 1997 to a nationally representative sample of 8,984 young men and women who were ages 12 to 16 as of December 31, 1996. The survey was administered through personal interviews with the youths and one of their parents, and it gathered extensive information on the youths' labor market behavior, education and training, family and community background, as well as important life events such as marriage or the birth a child. Through annual follow-up interviews, the NLSY97 will continue to track these youths as they make the transition from school to the world of work.

In the 1997 interview, youths who had attended the 9th grade or higher were asked a number of questions about participation in school programs designed to help them prepare for the world of work. Of the nearly 9,000 respondents, roughly half were asked the school-to-work questions.[9] The present analysis is restricted to these respondents, and table 2 provides some basic descriptive information on the group. The first column of table 2 provides the number of respondents with a particular characteristic, and the second column provides the weighted percentage that those respondents represent in the national population of youths born between 1980 and 1984.

The sample contains roughly equal numbers of girls and boys. Given the ages of the NLSY97 cohort, however, the majority of the high school respondents were in either the 9th or 10th grades in 1997. Only 74 respondents were in the 12th grade or higher. To the extent that participation in school-to-work programs is greater in the upper grades of high school, which we suspect is likely, our estimates on overall participation from the NLSY97 would underestimate school-to-work participation in high school.[10] While table 1 showed that almost three-quarters of the schools are public, table 2 shows that more than 90 percent of youths in 9th grade or higher attended public schools, again reflecting the fact that public schools tend to be larger than private schools.

The variables listed in table 2 are youth characteristics that we conjectured might be related to participation in school-to-work programs. These characteristics can be divided into two groups. The first set consists of characteristics related to socioeconomic status and is aimed at assessing the extent to

Table 2. Descriptive statistics on NLSY97 sample of youths in 9th grade or higher in 1997		
Characteristic	Unweighted N	Weighted percentage
Total	4,484	100.0
Sex		
Male	2,213	50.4
Female	2,271	49.6
Grade level		
9th	1,925	41.5
10th	1,635	36.3
11th	850	20.3
12th or higher	74	1.9
Race		
White	2,625	72.4
Black	1,176	15.3
Other	643	11.5
Unknown	40	0.8
Ethnicity		
Hispanic	935	13.0
Non-Hispanic	3,537	87.0
Household income		
1st quartile: Less than $26,000	1,002	25.1
2nd quartile: $26,001 to $45,015	774	24.9
3rd quartile: $45,016 to $70,002	689	25.0
4th quartile: $70,003 or more	665	25.0
Biological mother's education		
Less than high school	710	11.7
GED	227	5.0
High school graduate	1,413	32.6
Some college, no degree	641	15.1
Associates degree	388	9.4
College graduate	1,059	26.3
School type		
Public	4,013	90.2
Private	276	6.9
Other	158	2.9
Location		
Urban	2,631	54.4
Rural	1,853	45.6
GPA in 8th grade		
Low (Cs and/or Ds)	469	9.9
Medium (Cs and/or Bs)	2,359	50.2
High (As and/or Bs)	1,656	39.9
Employment status last week		
Working	1279	32.5
Not working	3205	67.5
College expectations		
0 percent chance	164	5.3
1 to 33 percent chance	297	8.2
34 to 66 percent chance	628	17.7
More than 66 percent chance	2,250	68.9
Course of study in high school		
General	2,593	56.0
Vocational, technical, or business	500	10.4
College prep	1,391	33.6

Note: Missing information on a particular characteristic will result in numbers (Ns) that do not add up to 4,484. Due to bunching, the percent in each quartile does not necessarily equal 25 percent.

which disadvantaged youths are targeted for school-to-work programs. These characteristics include gender, race, ethnicity, household income, education level of the youth's biological mother, whether the youth attends a public or private school, and whether the youth lives in an urban or rural location. The second set includes other characteristics that are related to the youth's work or school performance and are aimed at investigating what kinds of students tend to participate in these programs. These include academic performance in 8th grade, whether or not the youth is currently working, his or her expectations for completing college, and the course of study the youth is pursuing in high school.

Due to missing information, data on some of these youth characteristics are not available for all 4,484 respondents who were asked the questions about school-to-work programs.[11] For example, household income is missing for more than 1,300 youths in our analysis sample. There are two reasons for the high rate of missing data on income: First, respondents often refuse to answer questions about their income; second, the income information was collected in a separate interview with one of the youth's parents and not all parents provided an interview.

School-to-work programs

Under the guidance of the National School-to-Work Office, a limited number of school-to-work programs were chosen for inclusion in both the SAS96 and the NLSY97 questionnaires: internship/apprenticeship programs (asked about separately in SAS96, but combined in the NLSY97), job shadowing, mentoring, school-sponsored enterprise, career major, and cooperative education. The definitions given to respondents in the two surveys are similar but not identical. (See Appendix 1.)

Although the two surveys ask about the same programs, the students and the school administrators may not interpret the questions in exactly the same way. For example, a student who has received some career counseling may incorrectly respond that they had participated in a "career major" program, whereas a school administrator, who may have read the definition more closely, probably would not categorize career counseling as a career major program.

Given that the schools in the SAS96 were selected from the primary sampling units's where the NLSY97 youths live, we are able to match the NLSY97 youths with the high schools that they attend to examine the consistency in reporting of school-to-work programs between youths and schools. If the school reports offering a program and the student does not report participating, then no inconsistency need exist, since some students may not participate. On the other hand, if a school reports not offering a particular program and the student reports participating in this program, then there is a potential inconsistency.[12]

Comparison of participation rates. Table 3 shows participation rates in school-to-work programs for four different groups of youths who have attended 9th grade or higher: all youths, youths in schools that reported having the program, youths in schools that reported no corresponding program, and youths in schools that did not participate in the SAS96.

We find the results in Table 3 troubling because the participation rates among youths in schools with a particular program are very similar to those of youths in schools not offering the program. It is not clear whether the schools or the youths are incorrectly reporting. One problem with the school survey data is the substantial non-response to individual questions about school-to-work programs—roughly 12 to 18 percent of administrators did not respond to individual questions on whether or not the school offered a particular program. In defining whether a school offered a program in table 3, we treated nonresponses as "no" responses. For instance, if a school administrator did not respond to the question on whether the school offered an apprenticeship program, then it was assumed that the school did not have the program. Because this approach could result in misclassifying a school as not offering a program when in fact it did (but just failed to respond), we recalculated table 3 treating nonresponses to a particular program as nonrespondents (that is, we moved them to the "not surveyed or not responding" column of table 3). This reduced the discrepancy slightly, but by no means eliminated it. Another possible explanation for the inconsistency between school and youth reports is misclassification on the part of the youths. It may be that youths participated in school-to-work programs, but because they did not fully understand the

Table 3.	Participation rates in school-to-work programs by school reports			
	Participation rates of youths attending 9th grade or higher			
Characteristic	Total	Youths in schools reporting program	Youths in schools reporting no program	Youths in not surveyed schools or not responding
Any school- or work-based activity	38.3	38.5	36.4	38.7
Any work-based activity .	24.2	26.1	23.7	22.4
Job shadowing	12.6	15.1	12.1	11.5
School-sponsored enterprise	9.1	13.5	8.7	8.3
Mentoring	4.8	5.9	4.7	4.3
Apprenticeship/ internship	4.3	4.6	2.9	5.9
Any school-based activity	24.9	25.1	21.0	26.6
Career major	18.1	19.6	16.6	19.9
Tech prep	7.6	7.4	6.5	8.9
Cooperative education	6.8	6.3	6.5	7.5

Table 4.	Percentage of schools with a 12th grade offering school-to-work programs in 1996 (SAS96)	
	Percent	
Activity	Percentage of schools in 1996 that offered	
Any school- or work-based activity	64.2	
Any work-based activity	44.9	
Job shadowing	28.7	
Internship	16.6	
Mentoring	15.1	
Apprenticeship	13.9	
School-sponsored enterprise	12.7	
Any school-based activity	50.4	
Cooperative education	32.5	
Tech prep	33.2	
Career major	13.2	

definitions of the various types of programs, they misreported their participation in them; or, they simply interpreted the definitions differently from the school survey respondents.

Short of conducting a validation study, we have no way of knowing the source of the reporting error. As a result, the actual levels of participation rates by youths and incidence rates by schools should be viewed as rough estimates. However, unless reporting errors vary systematically by youth or school characteristics, differences across groups in participation or offering rates should be less affected by measurement error.

Incidence rates in SAS96

According to the SAS96 64.2 percent of schools with a 12th grade offered at least one school-to-work program to their students.[13] (See table 4.) The most prevalent work-based activity offered by schools was job shadowing, with nearly 29 percent of schools offering such programs. Job shadowing was followed by internship, mentoring, apprenticeship, and school-sponsored enterprise programs, with incidence rates for these programs ranging from 13 to 17 percent. In 1996, school-based activities were more commonly offered by schools than were work-based activities. Technical preparatory and cooperative education programs were the most common school-based activities and were offered by approximately 33 percent of schools. Career major programs were less prevalent, with 13.2 percent of schools offering them.

Next, we examine the extent to which schools offer more than one of these school-to-work programs. While 64 percent of schools offered at least one program, 26 percent offered three or more programs, and about 9 percent offered five or more programs. (See table 5.) About 22 percent of schools offered only one program, while 31 percent of schools offered at least one work-based and one school-based activity.

Table 6 shows the proportion of schools offering various

school-to-work programs by characteristics of the school and its student body. In the discussion that follows, we only mention differences in incidence rates that were found to be statistically significant.[14] In general, private schools have much smaller incidence rates for school-to-work programs. Only 24 percent of private schools offered at least one school-to-work program in 1996, compared with 78 percent of public schools. Incidence rates for each individual school-to-work program also were considerably lower among private schools than public schools. Among public schools, the percent of schools providing any school-to-work programs was highest among medium-size schools (750 to 1,500 students). This size pattern among public schools also holds for most of the individual school-to-work programs. Among private schools, the largest schools (i.e., schools with more than 300 students) were more likely to offer any school-to-work programs. However, this size pattern does not hold consistently for all of the various school-to-work programs.

In 1996, a higher percentage of suburban schools offered school-to-work programs than did urban or rural schools. This was particularly true for apprenticeship, school-sponsored enterprise, cooperative education, and technical preperatory programs. School-to-work programs were considerably less prevalent in schools with high graduation rates and a high percentage of graduates who go on to attend 4-year colleges. Table 6 shows that schools from which 98 percent or more of the students graduate had incidence rates for any school-to-work programs of 43 percent compared with about 70 percent for schools with lower graduation rates. We found similar differences between schools in which 68 percent or more of the students went on to attend 4-year colleges and schools with

Table 5.	Co-existence of selected school-based and work-based activities in school with 12th grade	
	SAS96	
Activity	Percentage of schools in 1996 that offered:	
Total activities		
At least 1	64.2	
At least 2	42.6	
At least 3	26.0	
At least 4	15.2	
At least 5	9.1	
Work-based activities		
At least 1	44.9	
At least 2	23.3	
At least 3	11.6	
School-based activities		
At least 1	50.4	
At least 2	22.7	
At least 3	5.7	
Exactly one school-to-work activity	21.6	
At least one work-based and one-school based activity	31.2	

Table 6.

| Table 6. | Prevalence of selected work- or school-based activities by school characteristics |

Characteristic	Percentage of schools								
	Any activities	Work-based activities					School-based activities		
		Apprentice-ship	Internship	Job shadowing	Mentoring	School-education enterprise	Career major	Cooperative	Tech prep
Total	64.2	13.9	16.6	28.7	15.1	12.7	13.2	32.5	33.2
Type									
Public	78.3	17.8	20.1	36.1	19.2	15.0	17.0	42.1	43.4
Private	24.2	3.1	6.9	7.9	3.7	6.0	2.3	5.3	4.3
Size									
Public:									
Small	75.3	16.0	16.4	34.3	15.6	12.3	14.8	36.1	40.3
Medium	87.3	23.2	30.0	43.4	29.6	23.2	22.8	57.8	54.7
Large	82.1	18.4	28.1	30.5	23.9	18.2	23.7	57.3	38.1
Private:									
Small	22.3	5.0	8.3	5.9	4.6	5.1	2.4	5.8	2.6
Medium	24.6	.7	5.6	9.0	3.0	8.0	1.8	3.8	5.4
Large	31.2	1.5	4.6	13.4	1.7	4.3	3.8	7.6	8.6
Location									
Urban	57.5	12.6	20.4	26.9	17.5	13.7	13.7	30.6	26.7
Suburban	67.4	16.2	18.9	29.5	18.4	16.0	14.3	36.2	40.7
Rural	64.2	10.9	11.1	29.6	9.6	7.2	11.6	30.1	28.0
Graduation rates quartile									
1st quartile (less than 85 percent) ..	67.9	14.4	20.0	31.8	23.9	15.5	20.4	35.3	37.2
2nd quartile (86 to 94 percent)	71.6	17.3	18.6	33.4	13.1	14.1	11.2	45.3	42.9
3rd quartile (94.8 to 97 percent)	72.3	14.2	18.7	40.3	14.7	15.3	12.8	28.9	38.5
4th quartile (more than 98 percent) .	42.5	7.9	7.3	10.3	7.3	4.4	7.1	18.8	14.7
Percentage of graduates who attend 4-year college									
1st quartile (less than 30 percent) ..	70.3	10.8	15.9	30.8	15.9	14.8	16.2	33.9	35.7
2nd quartile (31 to 44 percent)	76.7	23.0	23.6	45.7	26.9	20.3	15.0	47.0	44.1
3rd quartile (45 to 67 percent)	74.6	18.3	22.0	35.5	17.1	13.4	15.2	35.2	44.6
4th quartile (more than 68 percent) .	42.5	5.7	11.0	14.0	6.6	5.8	3.9	15.9	18.2
Black:									
Less than 25 percent	67.0	14.5	16.3	32.4	15.6	14.0	11.2	34.0	37.6
25 to 75 percent	72.8	17.6	22.8	26.6	22.0	13.1	23.4	41.8	35.6
More than 75 percent	67.3	21.8	15.9	17.5	16.7	17.2	32.2	24.1	23.4
Hispanic:									
Less than 25 percent	69.8	14.8	18.1	33.3	16.3	14.6	12.1	35.0	37.4
25 to 75 percent	69.1	10.2	17.9	24.9	19.7	13.3	28.4	39.0	34.3
More than 75 percent	67.6	18.1	24.1	22.7	22.0	13.9	26.9	39.4	41.4
School breakfast									
Yes	78.2	17.3	20.5	33.4	18.4	14.7	18.3	41.4	40.6
No	48.8	10.2	12.3	23.6	11.5	10.5	7.6	22.7	25.1
Title I									
Yes	68.1	11.1	15.4	30.3	13.5	10.5	14.4	32.7	34.6
No	61.2	16.1	17.5	27.5	16.4	14.3	12.3	32.3	32.1
Dropout prevention									
Yes	73.8	18.7	21.5	35.0	19.0	15.6	18.7	43.3	38.7
No	57.1	10.4	13.0	24.0	12.3	10.5	9.1	24.5	29.1

lower college enrollment rates—the schools with the higher college enrollment rates were less likely to offer any of the individual school-to-work programs.

As mentioned previously, the School-to-Work Act emphasizes the need to improve the transition from school to work for all students, but especially students from disadvantaged backgrounds. To see if school-to-work programs are more typical for such students, we next show how incidence rates of school-to-work programs vary with our descriptors for disadvantaged student bodies.

Schools in which 25 to 75 percent of the student body is black had a higher incidence rate for any school-to-work programs than did schools in which less than 25 percent of the student body is black.[15] This pattern also holds for the provision of apprenticeship, internship, mentoring, career major, and cooperative education programs. Provision of job shadowing programs, however, was highest among schools with the lowest percentage of black students. The provision of school-to-work programs does not appear to vary systematically by the percentage of Hispanic students. However, schools that offer a breakfast program or a dropout prevention program were more likely to provide school-to-work programs. The results for Title I schools were mixed, with higher incidence rates than non-Title I schools for some school-to-work programs and lower incidence rates for other programs.

Regression analysis.   Thus far in our analysis, we have shown incidence rates for school-to-work programs by various characteristics of the schools. Next, we use logistic regression analysis to estimate the probability that a school with any given set of characteristics offers school-to-work programs. This approach allows us to see the independent relationship of a particular characteristic with incidence rates, while holding constant the relationship of school-to-work programs to other characteristics.

We ran logistic regressions for three different dependent variables: provision of any school-to-work program, provision of any work-based program, and provision of any school-based program. Table 7 provides the odds ratios obtained from the logistic regressions. The odds ratios indicate how much more likely schools that differ with respect to a particular characteristic are to offer a given program, compared with other schools.[16] An odds ratio of 2 on the dummy variable for private school indicates that private schools are twice as likely to offer school-to-work programs as public schools. Similarly, an odds ratio of 1 indicates that they are equally likely, and an odds ratio of 0.5 indicates that they are half as likely. Table 7 shows that the actual odds ratio is 0.14, indicating that private schools are roughly 1/7th as likely as public schools to offer any school-to-work programs.

For characteristics that are continuous, such as school size, the odds ratio tells us how much more likely schools

that are one unit away from the mean for that characteristic are to offer a given program compared with schools at the mean for that characteristic. Because a change of one unit is not always the most meaningful, we divided school size by 100 and the percentage of blacks and Hispanics by 10 before entering them into the logistic analysis. By doing this, the resulting odds ratio for school size represents the change attributable to a change in school size of 100, and the odds ratio for percentage black or Hispanic represents the change attributable to a 10 percentage-point change in the percentage black or Hispanic.

The results from the regression analysis largely confirm our findings from the cross-tabulation analysis—namely, private schools are significantly less likely to provide school-to-work programs than are public schools. They are 0.3 times as likely as public schools to provide any work-based programs and 0.1 as likely to provide any school-based programs. School size is somewhat positively related to provision of school-to-work programs, particularly school-based programs. However, among private schools, large schools are slightly less likely to offer school-to-work programs. In terms of location, urban schools are less likely than suburban schools to provide school-based programs, while rural schools are less likely than suburban schools to provide work-based programs.

Schools with the highest graduation rates are less likely than other schools to provide any school-to-work programs, work-based programs, or school-based programs. Schools with the highest percentage of graduates going on to 4-year colleges also are less likely to provide any school-to-work program, especially school-based programs.

The findings are mixed regarding whether schools with less privileged student populations are more likely to offer school-to-work programs. For example, the percentage of black students at a school is not significantly related to the probability of providing school-to-work programs, whereas the percent Hispanic is slightly negatively related to provision of

Table 7.	Logistic regression results for probability of offering school-to-work programs		
	Odds ratio		
Characteristic	Any	Work-based	School-based
Private school	[1]0.14	[1]0.26	[1]0.11
School size/100	[1]1.03	1.01	[1]1.05
Private school size/100[1]	[1].92	[1].91	[1].95
Urban	.97	1.12	[1].84
Rural	.85	[1].78	1.03
Highest graduation rate quartile (98 percent or more)	[1]74	[1].69	[1]80
Highest 4-year college enrollment rate quartile (68 percent or more)	[1].68	93	[1].48

[1] Significantly different from 1 at 5-percent level.

Table 8. Participation rates in school-to-work programs

Characteristics	NLSY97
	Percentage of students in 9th grade or higher in 1997 who participated
Any school- or work-based activity	38.3
Any work-based activity	24.2
Job shadowing	12.6
School-sponsored enterprise	9.1
Mentoring	4.7
Apprenticeship/internship	4.3
Any school-based activity	24.9
Career major	18.2
Tech prep	7.6
Cooperative education	6.8

these programs. Furthermore, Title I schools are slightly less likely than non-Title I schools to offer school-to-work programs, but schools with dropout prevention programs are more likely to offer school-to-work programs.

Participation rates in the NLSY97

After examining how many and what types of schools offer school-to-work programs, we now turn to the question of how many students participate in these programs and what kinds of students choose to participate. To examine participation in school-to-work programs, we use data from the NLSY97. The data show that 38 percent of youths who have attended 9th grade or higher participated in at least one of the school-to-work programs covered in the survey. (See table 8.)

Among work-based activities, job shadowing was the most prevalent, with nearly 13 percent of youths participating in such programs. School-sponsored enterprise ranked second at 9.1 percent, and apprenticeships/internships and mentoring programs followed, with participation rates of about 4 percent each. In terms of school-based learning activities, the most common program was career major, with 18.2 percent of youths reporting having participated in such a program. This was followed by technical preparatory at 7.6 percent, and cooperative education at 6.8 percent.

Table 9 shows the extent to which the youths in our study participated in more than one school-to-work program. Participation in multiple programs is not common: only 6 percent of youths participated in three or more programs, and fewer than 1 percent participated in five or more programs. About 10 percent of youths who have attended the 9th grade or higher participated in at least one work-based activity and one school-based activity. The majority of students that participated in at least one program tended to participate in only that program—23 percent of youths reported participating in

only one activity.

What kinds of students tend to participate in school-to-work programs? Table 10 shows participation rates in the various programs by characteristics of the youths that we felt may influence the quality of worker that the youth ultimately may become when he or she joins the workforce. In the discussion that follows, we only mention differences in participation rates across groups that were found to be statistically significant.[17]

Participation in any school-to-work program does not appear to vary according to the youths' academic performance when in 8th grade. However, participation rates in certain programs do differ by grade point average. For example, youths whose grades were average had higher participation rates in apprenticeship/internship programs than youths with higher grades. Those with higher grades were more likely to participate in job shadowing.

Youths who worked while going to school were more likely to participate in school-to-work programs: 43 percent of the youths who reported working during the survey week participated in at least one school-to-work program, compared with 36 percent of the youths who did not work. Participation rates in most of the individual programs also were higher for working youths.[18]

Although the School-to-Work Act emphasizes the need to make school-to-work programs available to all students, we wondered if college-bound youths are as likely to participate in these programs as youths who do not intend to go to college. To address this question, we examine how par-

Table 9. Co-existence of selected school-based and work-based activities (NLSY97)

Characteristics	Percentage of students in 9th grade or higher in 1997 who participated in activities
Total activities:	
At least 1	38.3
At least 2	16.1
At least 3	5.6
At least 4	1.9
At least 5	.8
Work-based activities: .	
At least 1	24.2
At least 2	5.3
At least 3	1.1
School-based activities:	
At least 1	24.9
At least 2	6.7
At least 3	1.0
Exactly one school to work activity	22.7
At least one work-based and one-school based activity	10.3

Table 10.	Participation in school-to-work program by worker-related charcteristics							
	Percentage of youths in 9th grade or higher in 1997 who participated in activities							
	Work-based activities					School-based activities		
Characteristic	Any program	Apprentice-ship or internship	Job shadowing	Mentoring	School-sponsored enterprise	Career major	Cooperative education	Tech prep
Total	38.3	4.3	12.6	4.8	9.1	18.1	6.8	7.6
GPA in 8th grade								
Low (Cs and/or Ds)	38.8	3.8	10.4	4.2	6.9	16.1	8.3	10.0
Medium (Cs and/or Bs)	38.6	5.4	11.7	5.0	9.0	19.1	6.8	7.7
High (As and/or Bs)	37.8	3.1	14.3	4.6	9.7	17.6	6.4	6.9
Employment status last week								
Working	43.1	4.7	14.3	5.9	11.4	20.1	8.1	7.0
Not working	36.0	4.1	11.8	4.2	8.0	17.2	6.1	7.9
College expectations								
0 percent chance	34.2	3.7	9.4	2.5	7.9	15.6	7.0	8.5
1 to 33 percent chance	37.3	6.2	8.8	4.4	7.3	19.4	6.3	9.9
34 to 66 percent chance	37.9	3.9	11.7	4.5	8.2	20.7	8.7	7.8
More than 66 percent chance	40.5	4.9	4.2	5.6	10.1	18.8	6.6	8.0
Course of study in high school								
General	33.7	3.7	11.0	3.8	7.4	16.0	5.3	5.7
Vocational, technical, or business	63.5	10,7	13.8	6.6	14.9	36.5	20.0	20.7
College prep	38.1	3.4	15.0	5.8	10.0	16.1	5.2	6.8

ticipation in various school-to-work programs differs by the youth's self-reported expectations about completing college, while recognizing that these expectations may be influenced by school-to-work programs.

In the NLSY97 questionnaire, youths were asked: "What is the percent chance that you will have a four-year college degree by the time you turn 30?" Youths were then placed into four groups: those who said they had zero chance of receiving a college degree, those who said they had a 1- to 33-percent chance, those who said they had a 34- to 66-percent chance, and those who said their chance was greater than 66 percent. Interestingly, nearly 70 percent of the youths fell into the latter category, and only 5 percent said they had no expectations of completing a degree. Findings in Table 10 show that, if anything, individuals who perceive themselves as more likely to complete college have greater participation in school-to-work programs.

Participation in school-to-work programs was considerably higher for youths who characterized their course of study in high school as being a vocational, technical, or business program as opposed to a general or college preparatory program. This strong positive relationship is not surprising given that vocational, technical, or business-oriented programs are by their nature more focused on linking educational curricula to careers.

Table 11 shows participation rates in the various programs by youth characteristics related to socioeconomic status. These characteristics are of interest given the emphasis placed in the School-to-Work Act on providing school-to-work opportunities to youths that may ultimately become high school dropouts or have difficulties in the workforce.

Although women's labor force participation rates are approaching those of men, gender differences still exist in terms of occupational choices and long-term attachment to the workforce. Some of these differences may influence decisions about participating in certain school-to-work programs. Overall, participation rates in school-to-work programs are similar for young men and women. However, high school girls are more likely than their male counterparts to participate in a job shadowing program, and high school boys are more likely than their female counterparts to participate in a technical preparatory program.

Findings from NLSY97 indicate that black youths were more likely than other racial groups to participate in at least one school-to-work program. Blacks also had higher participation rates than whites in apprenticeship or internship programs, as well as in mentoring, career major, cooperative education, and technical preparatory programs. Hispanics, on the other hand, were less likely than non-Hispanics to participate in at least one school-to-work program, with significantly lower participation in job shadowing, school-sponsored enterprise, and career major programs.

As part of the interview with one of the youth's parents, information was collected on total income for the household in which the youth resides. Using this information, we were able to group the youths into four equal-sized income groups to see if participation in school-to-work programs varies by

household income. Participation rates in any school-to-work program do not vary systematically by income level. However, some differences do exist for individual programs. Youths in the highest income group, for example, were more likely to participate in job shadowing programs than those in the lowest income group. Youths in the bottom two income groups were more likely to participate in a career major program than were youths in the highest income group. Youths in the highest income group also were less likely than youths in the lowest income group to participate in cooperative education programs.

Although participation rates did not vary much by students' college expectations, the education level of the youth's biological mother does appear to be negatively related to participation in school-to-work programs. Youths whose mothers are college graduates are less likely to participate in at least one school-to-work program than are youths whose mothers are high school graduates. This relationship also holds for participation in apprenticeship or internship, career major, cooperative education, and technical preparatory programs. Youths

whose mothers have less than a high school education are less likely to participate in at least one school-to-work program than are youths whose mothers are high school graduates.

Consistent with the school survey, youths attending private high schools are less likely to participate in school-to-work programs than are those attending public schools. Approximately 26 percent of youths in private schools participated in at least one school-to-work program, whereas nearly 39 percent of public school students did.

Regression analysis. Similar to the strategy used in analyzing the school data, we now turn to our logistic regression analyses that estimate the probability that a youth with any given set of characteristics participates in school-to-work programs. This approach allows us to see the independent relationship of a particular characteristic with participation rates while holding constant the relationship of other characteristics. We ran regressions for three different dependent variables: participation in any school to work program, participa-

Table 11.	Participation in school-to-work programs by socioeconomic status-related characteristics							
		Percentage of youths in 9th grade or higher in 1997 who participated in activities						
Characteristic	Any program	Work-based activities				School-based activities		
		Apprentice ship or internship	Job shadowing	Mentoring	School-sponsored enterprise	Career major	Cooperative education	Tech prep
Sex								
Male	38.4	4.3	11.0	4.6	9.0	18.9	7.3	8.7
Female	38.2	4.3	14.3	5.0	9.2	17.4	6.3	6.6
Race								
White	37.7	3.9	13.2	4.2	8.6	17.4	6.2	7.2
Black	44.8	6.7	11.1	6.2	10.3	24.2	10.1	10.7
Other	34.5	4.3	10.9	6.0	10.5	15.9	5.6	6.5
Ethnicity								
Hispanic	32.0	4.1	8.9	4.7	7.3	15.8	5.4	6.9
Non-Hispanic	39.2	4.4	13.1	4.8	9.4	18.5	7.0	7.7
Household income								
Less than $26,000	39.5	6.1	11.3	3.9	8.1	20.5	8.5	7.7
$26,001 to 45,015	40.8	3.2	12.6	5.7	10.0	19.2	6.9	8.6
$45,016 to 70,002	38.8	3.6	14.1	5.4	10.2	18.0	5.5	8.7
$70,003 or more	38.6	4.3	14.7	4.3	9.2	15.1	6.0	6.3
Biological mother's education								
Less than high school ...	36.3	4.3	9.7	5.0	8.2	19.0	7.1	7.4
GED	42.0	7.9	13.0	5.8	9.4	17.9	10.0	9.6
High school graduate	41.1	5.5	12.7	4.6	9.0	21.5	7.8	8.2
Some college, no degree .	41.1	2.8	14.1	5.5	11.1	17.1	6.6	9.0
Associates degree	40.1	4.3	13.8	5.4	10.3	19.7	5.1	8.2
College graduate	32.9	3.0	12.7	4.0	8.1	13.6	5.4	5.5
School type								
Public	38.5	4.0	12.8	4.7	9.0	18.6	6.5	7.5
Private	25.9	3.2	9.5	2.5	8.6	6.8	3.5	1.8
Location								
Urban	37.6	4.6	11.7	4.8	9.6	17.7	6.6	7.4
Rural	39.2	4.0	13.8	4.7	8.5	18.8	7.0	7.9

Table 12.	Logistic regression results for probability of participating in school-to-work programs		
Characteristic	Odds ratio		
	Any	**Work-based**	**School-based**
Worker-related characteristics			
Low grades in 8th (Cs and/or Ds)	0.97	0.95	0.93
Medium grades in 8th (Cs and/or Bs)	98	[1]1.05	.90
Working	[1]1.31	[1]1.31	1.15
0 percent chance of completing 4-year college	[1].68	.77	.69
1 to 33 percent chance of completing 4-year college	[1].73	.72	[1].76
34 to 66 percent chance of completing 4-year college	[1]80	73	[1]90
General course of study in high school	[1].81	[1].75	.87
Vocational, technical, or business program	[1]2.26	1.26	[1]2.70
Socio-economic status related characteristics			
Female	.99	1.13	[1].82
Black	[1]1.33	[1]1.22	[1]1.41
Other	1.06	1.24	.90
Hispanic	.85	.76	.95
Log of annual household income	1.05	1.07	.99
Biological mother has less than high school degree	.97	1.09	95
Biological mother has GED	1.07	1.13	.87
Biological mother has some college, no degree	1.10	1.21	.90
Biological mother has associates degree	.99	1.03	.99
Biological mother has college degree	[1].97	1.00	[1].93
Private school	[1].55	[1].73	[1].36
Other type of school	1.36	1.18	[1]1.68
Urban	.97	1.03	.90

[1] Significantly different from 1 at 5-percent level.

tion in any work-based program, and participation in any school-based program. Table 12 provides the odds ratios obtained from the logistic regressions.[19]

Findings from the logistic regression analysis confirm many of the cross-tabulation results discussed previously. Youths who work are more likely (about 1.3 times more likely) to participate in any school-to-work program and any work-based program. Youths who characterized their course of study as general are less likely than college preparatory students to participate in any school-to-work program and any work-based program, whereas those who characterized their course of study as vocational, technical, or business-oriented were more than twice as likely as college preparatory students to participate in any school-to-work program and any school-based program.

In addition, black youths are more likely than white youths to participate in any program, any work-based program, and any school-based program. Students who attend private schools are less likely to participate in any program, any work-based program, and any school-based program than were students who attend public school. Lastly, students whose mothers are college graduates were slightly less likely to participate in any program and any school-based program than were students whose mothers are high school graduates.

HOW COMMON ARE SCHOOL-TO-WORK PROGRAMS? We have examined this question from two different perspectives—that of the Nation's high schools and that of its students. The SAS96 data show that school-to-work programs are commonly offered in U.S. high schools, with more than 60 percent of schools providing at least one such program. The NLSY97 data show that a fair number of high school students are participating in school-to-work programs, with about 38 percent of students reporting having participated in at least one program. However, we have some concerns about the quality of these data because sizable numbers of students in schools that supposedly do not have school-to-work programs reported participating in them. What kinds of schools offer school-to-work programs, and what kinds of students participate in them? The data indicate that private high schools and high schools with high graduation rates and college attendance rates are less likely to offer school-to-work programs.

Regarding the likelihood of schools with disadvantaged student populations offering school-to-work programs, our findings are somewhat ambiguous—on the one hand, schools with dropout prevention programs are more likely than other schools to offer school-to-work programs, while on the other hand, schools with high percentages of Hispanic students (who are more likely to be disadvantaged) and schools receiving Title I funding are less likely to offer these programs. Students who work while going to school are more likely to participate in school-to-work programs, as are youths who reported their course of study in high school as technical, vocational, or business-oriented. Also, blacks are more likely than whites to participate in school-to-work programs, whereas youths whose mothers are highly educated are less likely to participate in these kinds of programs. □

The views expressed in this article are those of the authors and do not necessarily reflect the views of the U.S. Department of Labor.

[1] The Act called for approximately $300 million to be appropriated for fiscal year 1995, with equal amounts being available for fiscal years 1996–99. Federal funding for school-to-work programs is scheduled to end in 2001.

[2] Concise definitions of these three components were not provided in the Act. The definitions that follow were developed by Mathematica Policy Research, Inc., an organization that has been involved in a large-scale study to evaluate school-to-work grants. See *The First National Survey of Local School-to-Work Partnerships: Data Summary*, August 1997.

[3] A copy of the School-to-Work Act is available on the Internet at **www.stw.ed.gov/factsht/act.htm**.

[4] The NLSY97 is an annual survey that, among other things, will interview youths while they make their transition from school to the workforce. When the present analysis was conducted, however, data were available from only one interview with these youths, and most of them were still attending school. Nonetheless, for an analysis of the effects of school-to-work programs on early youth outcomes, see David Neumark and Mary Joyce, "Evaluating School-To-Work Programs Using the New NLSY," Working Paper 7719 (Cambridge, MA, National Bureau of Economic Research, May 2000).

[5] Primary sampling units are geographical constructs consisting of either a metropolitan area or a county.

[6] Or 5,295 responses out of 7,390. Among the respondents, another 42 failed to answer any of the first 11 questions in the school-to-work section and thus were dropped from the analysis.

[7] "Title I" is short for "Part A of Title I of the Improving America's Schools Act of 1994, Reauthorization of the Elementary and Secondary Education Act of 1965." Title I is the largest Federal aid program for our Nation's schools and is aimed at providing educational services to children who are the furthest from meeting the standards that each State has set for all children.

[8] Throughout this article, all estimates of means, proportions, and percentages are sample-weighted. The logistic regression estimates that appear later are not weighted.

[9] Or 4,484 out of 8,984. Actually, 4,489 were asked the school-to-work questions, but 5 were dropped from the analysis due to missing or ambiguous information on their current grade level.

[10] Clearly, we will be able to examine this issue when data from later waves of the survey are available.

[11] To determine the number of respondents for which information on a given characteristic is missing, simply add up the unweighted numbers in the first column of table 2 and subtract the resulting sum from 4,484.

[12] There are, however, instances where this may be valid. In particular, in the NLSY97, the youth was asked whether they "ever" participated in these programs and not whether they participated in the programs at their current school, so it is possible that the youth could have participated in the program at another school or through an another organization (i.e. church, business group, or civic organization). However, we suspect that this is at most a minor part of the problem, as the inconsistencies appear almost as severe for school-based as for work-based programs.

[13] As mentioned previously, a nonresponse to the question on whether the school offered a particular program was treated as a "no" response. To the extent that this is not the case, the percent of schools estimated to have these programs will be underestimated.

[14] That is, we conducted a statistical test that incorporated the standard error associated with each estimate and found that the hypothesis that the two estimates are equal could be rejected at the 5-percent significance level.

[15] The incidence rate for schools in which 25 to 75 percent of the student body is black also was larger than the incidence rate for schools in which more than 75 percent of the student body is black; however, this difference, while similar in magnitude to the difference mentioned in the text, was not statistically significant.

[16] Note that the odds ratios on a discrete variable should be interpreted relative to the excluded category. The excluded categories in Table 7 are public schools, schools in suburban locations, schools with graduation rates in quartiles 1 to 3, schools with college enrollment in quartiles 1 to 3, schools without breakfast programs, schools without Title I funding, and schools without dropout prevention programs.

[17] Meaning that we conducted statistical tests incorporating the standard errors associated with each estimate and found that the hypothesis that the two estimates are equal could be rejected at the 5-percent significance level.

[18] We also examined the relationship between school-to-work programs and two alternative measures of working that may signal a different level of attachment to the labor force than holding a job during the survey week. The first was an indicator variable for whether or not the youth worked for an employer at any time during the 1996–97 school year or following summer. The second was an indicator variable for whether or not the youth worked for an employer during the 1996–97 school year. The results using the first work variable were very similar to those discussed in the text. The second work variable also was positively related to participation in school-to-work programs, but the association was not statistically significant.

[19] The excluded categories in Table 12 are youths whose grades in 8th grade were in the "A" to "B" range, youths not working, youths who said their chance of completing college was greater than 66 percent, youths in college preparatory course of study, male youths, nonblack and non-Hispanic youths, youths whose biological mother has a high school education, youths in public schools, and youths in rural areas.

Appendix: Definitions of school-to-work programs in NLSY97 and SAS96

The NLSY97 interviewers were instructed to show the respondents a card with the school-to-work programs and their definitions. The interviewers then asked, "Here is a list of some of the kinds of programs schools offer to help students prepare for the world of work. Have you ever participated in any of these programs through your school?" The following is the list of programs and their definitions (listed in the order in which they were asked):

- Career major program, which is a defined sequence of courses based upon an occupational goal;

- Job shadowing, which is to spend time following workers at a work site;

- Mentoring, which involves being matched with an individual in an occupation;

- Cooperative education, which combines academic and

vocational studies with a job in a related field;

- School-sponsored enterprise, which involves the production of goods or services by students for sale to or use by others;
- Tech prep, which is a planned program of study with a defined career focus that links secondary and post-secondary education;
- Internship or apprenticeship, which involves working for an employer to learn about a particular occupation or industry.

The SAS96 was administered by a paper questionnaire that was filled out by school administrators and mailed back to the National Opinion Research Center. The specific school-to-work programs were asked about in a grid-style questionnaire with each column pertaining to a different program. The grid was preceded by the following instructions and definitions of terms:

The questions on the following pages are about work-based and career-oriented activities offered at your school. Please refer to the glossary that follows for definitions of activities and terms referenced in this section.

- Apprenticeship: Typically, multiyear programs that combine school- and work-based learning in specific occupational areas or occupational clusters and are designed to lead directly into either a related postsecondary program, entry-level job, or registered apprenticeship program. May or may not include paid work experiences.

- Career major: A coherent sequence of courses based upon an occupational goal.

- Cooperative education: A method of instruction whereby students alternate or parallel their academic and vocational studies with a job in a related field. May or may not include paid work experiences.

- Internship: For a specified period of time, students work for an employer to learn about a particular industry or occupation. Students' workplace activities may include special projects, a sample of tasks from different jobs, or tasks from a single occupation. May or may not include paid work experiences.

- Job shadowing: Typically as part of career exploration activities in early high school, a student follows an employee for one or more days to learn about a particular occupation or industry. Job shadowing is intended to help students hone their career objectives and select a career major for the latter part of high school.

- Mentoring: Pairing a student with an employee over an extended period of time during which the employee helps the student master certain skills and knowledge the employee possesses, models workplace behavior, challenges the student to perform well, and assesses the student's performance. Mentoring may be combined with other work-based learning activities, such as internships or on-the-job training.

- School-sponsored enterprise: The production of goods or services by students for sale to or use by others. School-sponsored enterprises typically involve students in the management of the project. Enterprises may be undertaken on or off the school site.

- Tech prep: A planned program of study with a defined career focus that links secondary and post-secondary education.