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Exploring the Effects of Childhood Family Structure on Teenage and Young Adult Labor Force Participation

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Abstract

In examining teenage and young adult employment, this study has three objectives. It seeks to throw light on reasons that some teenagers work and some do not. It explores the effect teenage labor force participation has on teenage educational attainment. Finally, it considers the longer-term effects of early employment on young adult work and wages. Four cross-sectional analyses are performed separately for male and female cohorts of original National Longitudinal Survey of Youth (NLSY) respondents who were aged 14 through 16 at the first interview in 1979. These analyses take the fullest advantage of the longitudinal nature of the data, using information from every year available, 1979 through 1993. Childhood family structure is found to have little impact on teenage employment and timely high school graduation. However, there is evidence that teenage employment has positive effects on high school graduation and later labor force participation.

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The U.S. Department of Labor (1996) reports that the unemployment rate for the civilian, noninstitutionalized population aged 16 and over was 5.6 percent in March 1996. The unemployment rate for teenagers (aged 16–19) was 17.5 percent. In that month, 6.5 million teenagers were in the labor force, for a labor force participation rate of 55.8 percent. Of those participating, 5.6 million were employed. The unemployment rate for teenage males was 19.4 percent, higher than that for teenage females, 15.4 percent. The unemployment rate was lower for white teenagers (14.8 percent) than it was for black teenagers (33.5 percent).

Teenage employment can have a variety of lifetime consequences. Short-term positive effects include increased household income through earnings and increased human capital through job experience. But employment may negatively affect educational attainment by reducing the likelihood that a teenager will graduate from high school or will graduate "on time." Longer-term effects resulting from teenage employment may include a stronger attachment to the labor force and higher wages later in life; conversely, they may include reduced economic success as a result of reduced schooling.

In examining teenage employment, this study has three objectives. First, it seeks to understand why some teenagers work and some do not. Specifically, it explores the relationships among teenage labor force participation and household income and need, childhood experiences, the employment activities of other members of the teen's household, teenage fertility, and local macroeconomic conditions.

Second, it looks at educational attainment, considering whether there is a relationship between the likelihood of graduating from high school "on time" and having been employed while attending school.

Third, this study seeks to understand longer-term effects of teenage labor force participation. Specifically, do individuals who worked as teenagers demonstrate a stronger attachment to the labor force as young adults? Does teenage employment translate into higher wages for young adults?

This paper continues with a discussion of the literature surrounding teenage labor force participation and the effects of family structure on childhood outcomes. In Section II, hypotheses based on human capital theory are presented. Section III discusses the data and empirical methods. Results are provided in Section IV, and are discussed in Section V.

I. BACKGROUND

Teenage labor force participation has been studied extensively. Much of the literature examines the consequences of teenage employment. A smaller part of this literature focuses on why teenagers work. Powers (1994) seeks to assess the determinants of young adult inactivity for a sample of NLSY male respondents who were aged 14 through 17 in 1979, who lived at home and who reported working and/or attending school during the week prior to the survey in 1979. Powers used a discrete-time hazard analysis to examine how long it took these "active" teens to become inactive (not working, not in school, and not in the military). He found that the local opportunity structure and individual human capital characteristics were the most important determinants of inactivity for youth as a whole.

Keithly and Deseran (1995) used cross-sectional data from the 1980 Public Use Microdata Sample D (PUMS-D) for males and females aged 16 through 18 residing with their parent(s) to understand the relationship between family and work. They treated labor force participation as a dichotomous variable at a point in time. Family structures considered included married couples and female-headed households; all other household types were excluded. Their findings suggest that household structural characteristics and family resources have a significant effect on the entry of youths into the labor force. Youths from families with higher incomes are significantly more likely to be in the

labor force than youths from lower-income families. The authors conclude that youths from higher-income and higher-status households may enjoy advantages in access to jobs.

Researchers have studied the relationship between family and other adult outcomes. Children who grow up with only one parent have lower levels of educational attainment, become parents earlier, and are more likely to have premarital births, marry earlier, and divorce, than children who lived with both biological parents throughout their childhood (Astone and McLanahan, 1991; Bumpass and McLanahan, 1989; Garasky, 1995; Haurin, 1992; Haveman, Wolfe, and Spaulding, 1991; Hogan and Kitagawa, 1985; Krein, 1986; Krein and Beller, 1988; McLanahan, 1985, 1988; McLanahan and Bumpass, 1988; Mueller and Cooper, 1986; Sandefur, McLanahan, and Wojtkiewicz, 1992). For these children, many of the outcomes mentioned above, especially failure to finish high school, lead to reduced employment, lower earnings, lower occupational and economic attainment, lower family incomes, and a greater likelihood of receiving welfare assistance or going without material necessities during adulthood (Krein, 1986; Mueller and Cooper, 1986; Veum and Weiss, 1993).

Another focus of the literature on teenage work has been the transition from high school to employment. Light (1994) provides an extensive review of the literature that uses data from the National Longitudinal Surveys of Labor Market Experience (NLS) and arrives at two basic conclusions. First, she sees the NLS data as being unrivaled in their ability to allow researchers to understand the events that make up early employment careers. Second, Light finds the transition from school to work to be a complex phenomenon, blurred by experiences such as working while in school, participating in job training, reenrolling in school, searching for work, and being unemployed.

Among more recent studies of this transition, Lynch (1992, 1993) examines post-high-school training and its effect on wages. She finds that its incidence among entry-level job holders is low, even though training of any type (on the job or off the job) is related to higher wages. She concludes that policies which enhance educational and training opportunities for young workers with a high school

education or less would be beneficial. Wolpin (1992) examines the transition from school to full-time employment and subsequent labor mobility for “terminal” high school graduates and concludes that accepted wages would not be equalized across black and white male high school graduates by a policy that enforced racial equality of the wage offer functions. Similarly, Klerman and Karoly (1994) explore the transition from school to work among male high school students. Their results do not support the notion that male youth spend a considerable amount of time moving into and out of the labor force. They find that the median male high school graduate, who did not proceed immediately to postsecondary education, had, at age 20, already entered a job that would last at least two years. Unfortunately, neither Lynch (1992, 1993), Wolpin (1992), nor Klerman and Karoly (1994) consider the human capital and job experience gains made by individuals who are employed as teenagers prior to leaving high school.

The effect of high school employment on subsequent career outcomes (e.g., hourly wages or occupational status) has not been assessed satisfactorily to date. Theoretically, the effect is ambiguous. From a human capital perspective, employment generates human capital through experience. If, however, this experience is obtained at the cost of educational attainment, then the net effect of teenage employment may be negative. Light (1994), in her literature review, finds that many studies reach a common conclusion: that work experience obtained while in school is associated with a small increase in subsequent wages and a larger increase in subsequent labor supply. Light (1995) warns, however, that the net effect of high school employment on subsequent wages is extremely sensitive to how the wage model is specified and estimated. Ruhm (1994), after controlling for a variety of background variables which may be related to both the decision to obtain employment while in school and subsequent economic attainment, finds no evidence that low to moderate amounts of student employment has detrimental effects. Furthermore, job-holding in the senior year is found to be

associated with higher future economic attainment, as measured by earnings, wages, occupational status, and the receipt of fringe benefits.

In summary, the majority of research examining youth labor force participation has focused on postschooling experiences. In general, little attention has been give to the reasons for teenage employment and the relationship between family and work for teenagers (the work of Keithly and Deseran [1995] is an exception). The present study considers the effects of childhood family structure on both teenage employment and teenage educational attainment, as well as the longer-term effects of teenage employment, in particular, its effects on young adult labor force participation and wages.

II. CONCEPTUAL MODEL AND HYPOTHESES

Investments in human capital can take many forms, most obviously through formal schooling, but also through market work via on-the-job experience. Economic theory contends that additional schooling or job experience increase an individual's productivity in the labor market. Employers, recognizing this, pay higher wages to individuals with more formal schooling or more employment experience (Bryant, 1990).

Individuals may choose to increase their human capital in more than one way at a given time. For example, students often work while attending school. Since studying and working both require time, the working student must trade off one activity against the other. For working students, the tradeoff often takes the form of reduced academic performance or slower progress through a program (Bryant, 1990).

Human capital is also developed within the family by parents and other household members. Economic theory contends that it is more advantageous for children to live in a two-parent household, because there are more resources (time and possibly financial) to share. Both economic and sociological theory speak to the disadvantages of living outside the traditional two-biological-parent

family. Marital dissolution and nonmarriage reduce parental investment both in financial terms and in the time spent with the children (Becker, 1975, 1981; Bryant, 1990; Parish and Willis, 1993). Likewise, family disruption or nonmarriage weaken the parent-child relationship and reduce the internalization of parental values and role models (Hess and Camera, 1979).

The analyses conducted here offer several opportunities to test hypotheses related to human capital theory. Nine hypotheses relating to human capital investment are specified for clarity of presentation. Each will be tested separately for males and females.

Hypothesis 1: The effects of childhood family structure on teenage employment will vary with the type of family structure experienced and the child's age when the experience occurred.

Hypothesis 2: The likelihood that a teenager will be employed is related to the income of his or her household. The likelihood will increase with income, because more opportunities for employment are available for children from higher-income families. Conversely, the likelihood will decrease with income as the need for the additional income decreases.

Hypothesis 3: The likelihood that a teenager will be employed increases as household need (measured by the number of household members and the number of own children in the household) increases.

Hypothesis 4: The likelihood that a teenager will be employed increases as the number of other household members who are employed and act as role models increases.

Hypothesis 5: The effects of childhood family structure on the likelihood of graduating from high school on time (by age 19) will vary with the type of family structure experienced and the age of the child when the experience occurred.

Hypothesis 6: Teenage employment will affect the likelihood that an individual will graduate from high school on time (by age 19).

Hypothesis 7: Teenage employment and the labor force participation of young adults (i.e., from ages 20 through 24) are positively related.

Hypothesis 8: Teenage employment, educational attainment (as measured by years of education and by whether the individual graduated from high school on time), and labor force participation experiences earlier in life will affect an individual's labor force attachment later in life (measured at age 27).

Hypothesis 9: Teenage employment, educational attainment (as measured by years of education and by whether the individual graduated from high school on time), and labor force participation experiences earlier in life will affect an individual's wage rate later in life (measured at age 27).

III. DATA AND METHODS

Data for this study are from the 1979–1993 waves of the NLSY Geocode file. The NLSY was initiated in 1979 with a sample of 12,686 men and women ages 14 through 22. The full sample includes a nationally representative random sample; oversamples of blacks, Hispanics, and economically disadvantaged whites; and a special sample of military personnel. Labor force participation data are gathered annually, providing detailed employment information for respondents during their teenage and young adult years. The sample for this study is restricted to respondents aged 14 through 16 in 1979. For these individuals, *complete* labor force participation information is available for ages 16 through 18. There are 4,074 original respondents in this age range. Sample sizes for specific analyses will be smaller than 4,074, varying by gender and the degree of missing data. Complete childhood family structure histories are available through a 1988 retrospective survey.

The analyses focus on respondents at specific ages, thus draws data from different calendar years. Controls for using data from different years in these cross-sectional analyses include cohort

indicator variables and adjustment of nominal wages and other dollar amounts for inflation using the Consumer Price Index for All Urban Consumers (CPI-U).

Garasky's (1995) model of childhood family structure will be used to capture these effects on teenage employment and timely high school graduation. Garasky (1995) expands family structure modeling in three ways. First, single-parent and stepparent family structures are disaggregated by which biological parent lives with the child. Specifically, the six family structures that are considered are living (1) with both biological parents, (2) with mother only, (3) with father only, (4) with mother and stepfather, (5) with father and stepmother, and (6) in some other type of arrangement that does not include either biological parent. Second, family structure experiences are considered during four specific periods of childhood: birth through age 3, and ages 4 through 6, 7 through 10, and 11 through 14. The periods coincide roughly with the sequence of educational experiences for children: (1) no formal educational arrangements, (2) preschool, (3) elementary school and (4) middle school. Third, the effect of a *change* in family structure is examined for variation with the age of the child at the time the change occurred.

The research design has four parts. First is an analysis of factors related to the number of years (0 through 3) a teenager is employed between ages 16 to 18. The second part studies the probability of graduating from high school "on time" (by age 19). Teenage employment and graduating from high school on time are not considered to be simultaneously determined. Third is a study of the determinants of respondents' labor force participation over the five-year period following high school completion, that is, during ages 20 through 24. Finally, a selection model examines labor force participation and wage rates for respondents at age 27 (chosen because members of the youngest cohort in the study sample were this age for the most recent data available, the 1993 survey). All analyses examined male and female respondents separately, to test whether explanatory factors affect outcomes of interest

differently by gender. Each analysis is discussed in more detail below. Complete definitions of all terms used in the analyses are found in the Appendices.

Teenage employment is a function of economic and sociological factors. Specifically,

$$TEENEMP_i = f(INSCHOOL(16\text{-}18)_i, HOUSEHOLD_i, UNEMP_{i,j}, FAMSTR_i, X_i) \quad (1)$$

where for individual *i* living in area *j*, TEENEMP equals the number of years employed from ages 16 to 18; INSCHOOL(16-18) equals the number of years in school from ages 16 to 18; HOUSEHOLD is a vector of characteristics for the respondent's household when he or she was aged 16 through 18; UNEMP is the local unemployment rate, representing the macroeconomic environment in which the respondent lived during this period; FAMSTR is a vector of terms representing childhood family structure experiences from birth through age 14; and X is a vector of personal characteristics.

A year of employment is defined as being employed for at least 26 weeks in the calendar year. Because this analysis looks at employment while respondents are still of school age, employment is not limited to having worked a specific number of hours in a given week or a total number of hours in the year. This definition of work, however, does require students to participate in the labor force at least part of the school year.

Hypothesis 1, that childhood family structure experiences will affect teenage employment, is tested in two ways. First, equation (1) is estimated without and with the vector FAMSTR. A chi-square test of the difference in the log-likelihood measures for each estimation indicates if the entire vector of terms adds to the explanatory power of the model. Second, individual coefficient estimates from the terms in this vector will be used to test the hypothesis. Hypotheses 2 through 4 are tested with coefficient estimates from the vector HOUSEHOLD. Specifically, hypothesis 2 is tested by the coefficient of "Real Net Income"; hypothesis 3 by "Number of Household Members" and "Number of

Own Children"; and hypothesis 4 by "Number of Household Members Working."A Tobit analysis is used since the dependent variable is bounded between zero and three (Greene, 1993).

Teenage educational attainment is measured as a dichotomous variable indicating whether or not the respondent graduated from high school by age 19. The concept being examined is whether the teenager made normal progress through school *and* graduated. Specifically,

$$HSGRAD19_i = f(TEENEMP_i, HOUSEHOLD_i, UNEMP_{i,j}, FAMSTR_i, X_i) \quad (2)$$

where for individual *i* living in area *j*, HSGRAD19 is a dichotomous dependent variable equaling "one" if he or she graduated from high school by age 19. The remaining terms in equation (2) are identical to those in equation (1). Note that the dependent variable from equation (1), TEENEMP, is now an explanatory variable in this equation. The fifth hypothesis, that childhood family structure affects this measure of educational attainment, is tested in two ways, similarly to hypothesis 1. The coefficient on TEENEMP tests hypothesis 6, that teenage employment will affect academic progress. Human capital theory suggests that this effect will be negative because both activities compete for a limited resource, time. A binomial probit analysis is used as a result of the dichotomous dependent variable (Greene, 1993).

Young adult labor force participation (LFP) is measured in two ways over the five-year period from ages 20 through 24. First, the reported number of hours worked annually is summed over the period (TOTHRSWK). Second, the weeks reported to be out of the labor force each year are summed (TOTWKOLF). The first measure captures the "intensity" of the respondent's labor force attachment (i.e., part-time or full-time work). The second measure considers the amount of time spent completely removed from the labor force. Specifically,

$$LFP_i = f(TEENEMP_i, HSGRAD19_i, INSCHOOL(20\text{-}24)_i, HOUSEHOLD_i, UNEMP_{i,j}, X_i) \quad (3)$$

where for individual *i* living in area *j*, LFP is measured in the two ways discussed above. TEENEMP and HSGRAD19 are measured as in equation (2). The vectors INSCHOOL(20-24), HOUSEHOLD, and X, and the variable UNEMP capture the same concepts as in the earlier equations, but in some instances are measured differently. For example, INSCHOOL(20-24) is a set of five variables (one for each year from ages 20 through 24) measuring the number of months the respondent was in school that year. Similarly, for the vector HOUSEHOLD, "Number of Own Children" and "Real Net Income" also are measured for each of the five years. It is thought that early in adulthood, as individuals make important life course transitions, these measures may affect labor force participation differently at different ages. (See the Appendix for more details regarding data definitions.) Hypothesis 7 is tested through the TEENEMP term. A Tobit analysis is used here because the dependent variables TOTHRSWK and TOTWKOLF are bounded below by zero (Greene, 1993).

Labor force participation and wages at age 27 are examined using a standard sample selection model (Greene, 1993; Heckman, 1979). First, a labor force participation equation is estimated, because wages are observable for only those individuals who worked.

$$WORKING_i = f(TEENEMP_i, HSGRAD19_i, WORK\ EXPERIENCE_i, TOTAL\ EDUCATION_i, INSCHOOL(27)_i, HOUSEHOLD_i, UNEMP_{i,j}, X_i) \quad (4)$$

where, for individual *i* living in area *j*, WORKING equals one if the respondent worked at least one hour during the year. TEENEMP and HSGRAD19 are defined as before. WORK EXPERIENCE is the total number of weeks the respondent was employed from ages 19 through 26. TOTAL EDUCATION is a vector of indicator variables for the level of education attained by age 27. INSCHOOL(27) is an

indicator variable equaling one if the respondent was in school for any part of the year in which he or she was aged 27. HOUSEHOLD, UNEMP, and X are vectors of terms similar to those used earlier. (See the Appendix for more details.) TEENEMP, TOTAL EDUCATION, HSGRAD19, and WORK EXPERIENCE each test the hypothesis that these factors are related to labor force participation (hypothesis 8). A binomial probit analysis is used because of the dichotomous dependent variable (Greene, 1993).

Wages are examined for all respondents who worked at age 27. The term WAGES is the highest reported hourly wage received by the respondent among all the jobs that he or she held that year. The highest wage is chosen to represent this individual's greatest return received from the labor market on his or her human capital. Note that the job with the highest wage may not have been the respondent's primary occupation at that time.

$$\begin{aligned} LN(WAGES_k)_I = f(&TEENEMP_i, HSGRAD19_i, OTHER\ EXPERIENCE_i, \\ &TOTAL\ EDUCATION_i, UNEMP_{i,j}, JOBCHAR_{i,k}, X_i, \lambda_i) \end{aligned} \tag{5}$$

where for individual *i* living in area *j*, $LN(WAGES_k)$ is the natural logarithm of WAGES for job *k*, the respondent's highest hourly wage job. Explanatory terms in equation (5) are identical to those in equation (4) with four exceptions. OTHER EXPERIENCE in the wage equation is a vector of terms related to the respondent's employment experience outside of job *k*. Second, the vector of HOUSEHOLD terms explaining labor force participation in equation (4) is not included in this wage equation. Third, a vector of terms related to the characteristics of job *k* (JOBCHAR) is added to the equation. Specifically, this vector has three terms indicating whether the job is self-employment, whether it is unionized, and the respondent's tenure (total number of weeks) in this job. Finally, λ is the inverse Mill's ratio estimated from the labor force participation equation. The same explanatory terms in equation (4) that test hypothesis 8 (TEENEMP, TOTAL EDUCATION, HSGRAD19, and OTHER

EXPERIENCE) are included in equation (5) to test the hypothesis that they affect the respondent's wage rate (hypothesis 9). This equation is estimated using least squares since the natural logarithm of wages is unbounded (Greene, 1993).

IV. RESULTS

Teenage Employment: Tables 1 and 2 report the results of the Tobit analyses examining teenage employment for the study sample. Overall, the vector FAMSTR (consisting of explanatory variables related to the respondent's childhood family structure experiences) offers mixed results for testing hypothesis 1, that those experiences affect teenage employment. The chi-square tests of the difference in the log-likelihood values of the estimations with and without FAMSTR indicate that, for males, the addition of variables capturing childhood family structure does not add to the explanatory power of the model. For females, the additional terms do improve the power of the model. The value of the chi-square test statistic is not statistically significant at the 5 percent level for males, but is significant for females. From a theoretical perspective, however, the two sets of circumstances that are statistically significant for males (living with mother and stepfather from ages 7–10 and 11–14) and the two that are significant for females (living with father and stepmother from ages 4–6; living with father only from ages 11–14) do not provide much information about how childhood family structure affects the likelihood of teenage employment.

Hypotheses 2 through 4 are tested with coefficient estimates from the vector HOUSEHOLD. Specifically, the insignificant coefficient estimates for "Real Net Income" for model specifications with and without the family structure vector and for both males and females in Tables 1 and 2 indicate that household need, measured by household income net of the respondent's salary and wages, does not affect teenage employment patterns (hypothesis 2).

TABLE 1
Employment of Males Aged 16 through 18

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	1.025*	2.36*	1.261*	2.82*
School	2.655	-0.048	-0.54	-0.061	-0.68
Mother High School Graduate	0.566	0.149	1.01	0.176	1.20
No. Household Members	3.644	0.023	0.46	0.007	0.13
No. in Household Working	1.377	0.011	0.09	0.010	0.09
No. Own Children	0.030	0.379	1.25	0.390	1.29
Real Net Income	15.820	0.009	1.34	0.006	0.98
Unemployment Rate	8.451	-0.048	-1.89	-0.051*	-2.01*
Family Structure					
Respondent aged 0–3					
Father only	0.013			0.559	0.31
Father and stepmother	0.012			1.686	0.82
Mother only	0.095			-0.178	-0.40
Mother and stepfather	0.022			-0.296	-0.35
Other	0.039			-0.236	-0.28
Respondent aged 4–6					
Father only	0.016			-2.054	-1.35
Father and stepmother	0.015			-0.839	-0.48
Mother only	0.113			0.335	0.67
Mother and stepfather	0.044			0.134	0.18
Other	0.051			1.128	1.30
Respondent aged 7–10					
Father only	0.018			-0.460	-0.34
Father and stepmother	0.019			0.351	0.25
Mother only	0.135			-0.875	-1.85
Mother and stepfather	0.059			-1.496*	-2.17*
Other	0.055			-1.625	-1.93
Respondent aged 11–14					
Father only	0.022			0.742	0.83
Father and stepmother	0.020			0.683	0.62
Mother only	0.158			0.118	0.32
Mother and stepfather	0.078			1.101*	2.08*
Other	0.059			0.308	0.50

(table continues)

TABLE 1, continued

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Family Structure Change					
0–3 yrs	0.068			0.459	1.15
4–6 yrs	0.073			0.349	1.03
7–10 yrs	0.084			-0.200	-0.67
11–14 yrs	0.104			-0.323	-1.46
AFQT	35.850	0.009*	3.10*	0.008*	2.83*
Age 15 in 1979	0.384	0.032	0.18	0.027	0.16
Age 16 in 1979	0.377	0.116	0.63	0.106	0.58
Attends Religious Services	0.817	0.408*	2.47*	0.386*	2.32*
Black Male	0.260	-1.279*	-6.86*	-1.194*	-6.33*
Hispanic Male	0.160	-0.469*	-2.23*	-0.468*	-2.22*
Region					
North Central	0.261	0.051	0.28	0.083	0.45
Northeast	0.183	-0.418*	-2.17*	-0.426*	-2.21*
West	0.185	0.382	1.90	0.397*	1.96*
Poor White Oversample	0.121	-0.093	-0.43	-0.076	-0.35
Urban Area	0.755	0.159	0.95	0.169	1.01
Mean of Dependent Variable (TEENEMP) = 1.387					
Sample Size = 1746					
Log-Likelihood		-2589.701		-2578.215	
-2*(Difference in L-Likelihood)			22.972		
Chi-square(24), p=0.95			36.42		

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

TABLE 2
Employment of Females Aged 16 through 18

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	1.142*	2.49*	1.279*	2.76*
School	2.665	0.045	0.46	0.050	0.51
Mother High School Graduate	0.516	0.070	0.50	0.066	0.47
No. Household Members	3.607	0.029	0.58	0.013	0.25
No. Members Working	1.303	-0.109	-0.88	-0.089	-0.71
No. Own Children	0.173	-1.435*	-7.82*	-1.451*	-7.92*
Real Net Income	15.130	-0.004	-0.56	-0.005	-0.73
Unemployment Rate	8.292	-0.107*	-4.08*	-0.109*	-4.15*
Family Structure					
Respondent aged 0–3					
Father only	0.017			1.910	1.23
Father and stepmother	0.013			-2.083	-1.04
Mother only	0.086			0.470	1.08
Mother and stepfather	0.022			0.967	1.23
Other	0.033			1.323	1.71
Respondent aged 4–6					
Father only	0.018			-0.710	-0.44
Father and stepmother	0.017			4.230*	1.99*
Mother only	0.110			-0.549	-1.20
Mother and stepfather	0.045			-0.719	-1.05
Other	0.046			0.553	0.59
Respondent aged 7–10					
Father only	0.019			0.215	0.18
Father and stepmother	0.019			-2.900	-1.58
Mother only	0.147			-0.273	-0.66
Mother and stepfather	0.070			-0.758	-1.16
Other	0.052			-0.071	-0.06
Respondent aged 11–14					
Father only	0.020			-2.746*	-2.55*
Father and stepmother	0.024			0.561	0.68
Mother only	0.177			0.252	0.70
Mother and stepfather	0.091			0.581	1.21
Other	0.055			-1.710	-1.86

(table continues)

TABLE 2, continued

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Family Structure Change					
0–3 yrs	0.075			0.079	0.21
4–6 yrs	0.083			-0.098	-0.29
7–10 yrs	0.102			0.310	1.06
11–14 yrs	0.116			0.022	0.11
AFQT	34.920	0.015*	5.01*	0.014*	4.80*
Age 15 in 1979	0.374	-0.284	-1.66	-0.301	-1.77
Age 16 in 1979	0.404	0.000	0.00	-0.007	-0.04
Attends Religious Services	0.866	0.405*	2.22*	0.375*	2.07*
Black Female	0.255	-1.439*	-7.61*	-1.374*	-7.13*
Hispanic Female	0.185	-0.601*	-3.07*	-0.556*	-2.86*
Region					
North Central	0.249	0.662*	3.82*	0.618*	3.58*
Northeast	0.168	0.252	1.35	0.216	1.16
West	0.187	0.692*	3.68*	0.676*	3.60*
Poor White Oversample	0.120	-0.018	-0.09	0.076	0.36
Urban Area	0.751	0.156	0.96	0.171	1.06
Mean of Dependent Variable (TEENEMP) = 1.222					
Sample Size = 1676					
Log-Likelihood		-2325.606		-2305.659	
-2*(Difference in L-Likelihood)			39.894		
Chi-square(24), p=0.95			36.42		

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

Hypothesis 3, that household need leads to increased likelihood of employment, is not supported for males; the coefficients for "Number of Household Members" and "Number of Own Children" are insignificant in both empirical specifications. The result is the same for females, but for different reasons. The coefficient for "Number of Household Members" is insignificant, but the coefficient for "Number of Own Children" is significant and negative. A teenage mother living with her own children works less, not more as was hypothesized.

The employment patterns of other household members do not affect teenage employment (proposed in hypothesis 4). The term "Number of Household Members Working" is not statistically significant for either specification for males or females.

Several other factors are, however, related to employment for teenage males and females. Attending religious services positively affects teenage employment. This either reflects the value to teenagers of having a local network of friends for obtaining employment, or is a proxy for some unmeasured attribute of churchgoing teenagers that is correlated with their being employed. Macroeconomic conditions, as measured by the local unemployment rate, affect both males and females. Employment is lower among males in the Northeast than among other males. It is greater among males and females in the West and males in the North Central region than among their peers in other regions. There is no difference in employment levels between urban and rural teenagers, or among the three NLSY cohorts (14-, 15-, and 16-year-olds in 1979) for either gender. For both genders, blacks and Hispanics are found to have less teenage employment than whites.

Teenage Educational Attainment: Tables 3 and 4 provide the results of the probit analyses of factors affecting the probability that an individual will graduate from high school by age 19. As for hypothesis 1, there is mixed support for hypothesis 5, that childhood family structure experiences will affect the likelihood of graduating from high school on time. Chi-square test statistics of the difference in the log-likelihood values of the two estimated models (with and without the vector

TABLE 3
Probit for Graduating from High School by Age 19: Males

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	-0.666*	-3.00*	-0.446	-1.91
TEENEMP	1.387	0.065*	2.13*	0.064*	2.04*
Mother High School Graduate	0.566	0.114	1.47	0.119	1.49
No. Household Members	3.644	-0.057*	-2.15*	-0.059*	-2.17*
No. Household Members Working	1.377	0.061	0.95	0.028	0.43
No. Own Children	0.030	-0.434*	-2.46*	-0.428*	-2.43*
Real Net Income	15.820	0.018*	4.80*	0.017*	4.20*
Unemployment Rate	8.451	-0.005	-0.35	-0.010	-0.70
Family Structure					
Respondent aged 0–3					
Mother and Stepfather	0.022			0.447	0.95
Mother Only	0.095			0.255	1.04
Father and Stepmother	0.012			0.552	0.40
Father Only	0.013			27.252	0.08
Other	0.039			0.630	1.34
Respondent aged 4–6					
Mother and Stepfather	0.044			-0.297	-0.69
Mother Only	0.113			-0.011	-0.04
Father and Stepmother	0.015			-23.105	-0.02
Father Only	0.016			-35.902	-0.09
Other Family Structure	0.051			-0.706	-1.51
Respondent aged 7–10					
Mother and Stepfather	0.059			0.081	0.22
Mother Only	0.135			0.015	0.06
Father and Stepmother	0.019			-4.457	-0.01
Father Only	0.018			8.365	0.07
Other	0.055			0.315	0.70
Respondent aged 11–14					
Mother and Stepfather	0.078			-0.581*	-2.02*
Mother Only	0.158			-0.240	-1.19
Father and Stepmother	0.020			27.639	0.08
Father Only	0.022			-0.451	-0.84
Other	0.059			-0.113	-0.33

(table continues)

TABLE 3, continued

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Family Structure Change					
0–3 yrs	0.068			0.080	0.36
4–6 yrs	0.073			-0.016	-0.08
7–10 yrs	0.084			-0.293	-1.75
11–14 yrs	0.104			-0.194	-1.57
AFQT	35.850	0.022*	13.04*	0.023*	13.02*
Age 15 in 1979	0.384	-0.086	-0.92	-0.071	-0.74
Age 16 in 1979	0.377	-0.193	-1.91	-0.230*	-2.22*
Attends Religious Services	0.817	0.216*	2.44*	0.192*	2.10*
Black Male	0.260	0.594*	5.89*	0.632*	6.02*
Hispanic Male	0.160	0.122	1.06	0.126	1.07
Region					
North Central	0.261	0.183	1.80	0.233*	2.23*
Northeast	0.183	0.074	0.69	0.106	0.96
West	0.185	-0.024	-0.22	0.012	0.11
Poor White Oversample	0.121	-0.267*	-2.29*	-0.276*	-2.30*
Urban Area	0.755	-0.216*	-2.34*	-0.240*	-2.52*
Mean of Dependent Variable (HSGRAD19) = 0.648					
Sample Size = 1746					
Log-Likelihood		-897.0402		-864.023	
-2*(Difference in L-Likelihood)			66.0344		
Chi-square(24), p=0.95			36.42		

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

TABLE 4
Probit for Graduating from High School by Age 19: Females

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	-0.660*	-2.57*	-0.544*	-2.02*
TEENEMP	1.222	0.129*	3.53*	0.134*	3.52*
Mother High School Graduate	0.516	0.219*	2.55*	0.246*	2.77*
No. Household Members	3.607	-0.020	-0.66	-0.035	-1.11
No. in Household Working	1.303	0.253*	3.28*	0.260*	3.28*
No. Own Children	0.173	-0.838*	-8.83*	-0.844*	-8.74*
Real Net Income	15.130	0.015*	3.26*	0.010*	2.21*
Unemployment Rate	8.292	0.004	0.26	0.006	0.38
Family Structure					
Respondent aged 0–3					
Mother and Stepfather	0.022			0.245	0.51
Mother Only	0.086			0.235	0.89
Father and Stepmother	0.013			2.008	1.58
Father Only	0.017			-0.167	-0.14
Other	0.033			-0.013	-0.03
Respondent aged 4–6					
Mother and Stepfather	0.045			-0.117	-0.28
Mother Only	0.110			-0.307	-1.13
Father and Stepmother	0.017			-0.521	-0.46
Father Only	0.018			-0.892	-0.81
Other	0.046			-0.138	-0.27
Respondent aged 7–10					
Mother and Stepfather	0.070			-0.052	-0.13
Mother Only	0.147			0.262	1.05
Father and Stepmother	0.019			-0.354	-0.37
Father Only	0.019			1.799*	2.20*
Other	0.052			0.776	1.12
Respondent aged 11–14					
Mother and Stepfather	0.091			0.258	0.87
Mother Only	0.177			-0.413	-1.95
Father and Stepmother	0.024			0.286	0.50
Father Only	0.020			-1.377*	-2.12*
Other	0.055			-1.162*	-2.03*

(table continues)

TABLE 4, continued

Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Family Structure Change					
0–3 yrs	0.075			0.218	0.95
4–6 yrs	0.083			0.071	0.34
7–10 yrs	0.102			-0.419*	-2.43*
11–14 yrs	0.116			-0.171	-1.35
AFQT	34.920	0.021*	10.11*	0.022*	10.34*
Age 15 in 1979	0.374	-0.148	-1.39	-0.177	-1.61
Age 16 in 1979	0.404	-0.029	-0.26	-0.039	-0.34
Attends Religious Services	0.866	0.235*	2.12*	0.219	1.92
Black Female	0.255	0.749*	6.22*	0.884*	6.87*
Hispanic Female	0.185	0.259*	2.12*	0.285*	2.27*
Region					
North Central	0.249	0.017	0.15	0.029	0.25
Northeast	0.168	-0.141	-1.19	-0.118	-0.97
West	0.187	-0.309*	-2.68*	-0.269*	-2.26*
Poor White Oversample	0.120	-0.378*	-3.00*	-0.327*	-2.51*
Urban Area	0.751	-0.306*	-2.98*	-0.311*	-2.93*
Mean of Dependent Variable (HSGRAD19) = 0.715					
Sample Size = 1676					
Log-Likelihood		-724.4755		-697.690	
-2*(Difference in L-Likelihood)		53.5712			
Chi-square(24), p=0.95			36.42		

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

FAMSTR) indicate that these terms add to the explanatory power of the model. Results are statistically significant at the 5 percent level for both samples, males and females. Once again, however, the individual coefficient estimates do not display a consistent pattern regarding how these experiences affect chances for timely graduation.

Hypothesis 6 is that teenage employment will affect the probability of graduating from high school by age 19. The coefficient is positive and significant for both males and females for both model specifications, although economic theory suggests that this relationship might be negative, because both activities compete for the scarce resource of time. These findings suggest that employment might offer teenagers greater incentive to keep up with their studies so that they not only receive their high school diploma, but receive it on time.

In this analysis, coefficients for several terms from the vector HOUSEHOLD are significant, unlike in the analyses of teenage employment. Interestingly, some of the effects are consistent for both genders while others are not. For example, having a mother who graduated from high school and having other household members who work are both positively related to timely high school graduation for females, but not for males. The presence of more household members reduces the likelihood that males will graduate by age 19, but does not affect whether females graduate on time. Teenage parenting, as measured by having one's own children in the household, significantly reduces the likelihood of timely graduation for both males and females. Greater real net household income increases graduation chances for both genders.

Several personal characteristics are found to be related to the probability that both males and females will graduate from high school by age 19. An individual's percentile score on the Armed Forces Qualification Test (AFQT), a measure often used to indicate intellectual abilities, is positively related to graduating from high school on time. Similarly, attending religious services increases chances for timely graduation, possibly by giving a teenager a support group that provides encouragement and

assistance, although again, this term could be correlated with some unmeasured characteristic that is positively related to timely graduation. All other things being the same, black males are more likely to graduate on time than are white or Hispanic males, and black and Hispanic females than white females. Both male and female respondents from the oversample of economically disadvantaged whites are less likely to graduate on time, as are urban males. There is little regional variation, except that North Central males are more likely, and females from the West are less likely, to graduate by age 19. The oldest cohort of males (aged 16 in 1979) was also less likely to graduate on time. Finally, the local macro economy, as measured by the local unemployment rate, had no effect on timely high school graduation for either gender.

Young Adult Labor Force Participation: Respondents' labor force participation for the years from ages 20 through 24 is measured, first, as the total number of hours worked over this period, and second, from the perspective of attachment to the labor force, through the number of weeks out of the labor force. Hypothesis 7, that respondents who worked more as teenagers will show greater labor force participation as young adults, is supported. For both males and females, teenage employment is positively related to the number of hours worked and negatively related to the number of weeks out of the labor force. Graduating from high school by age 19 has similar effects on labor force participation for both genders.

It appears that the proposition that time spent in school competes with time in employment, and vice versa, is relevant for young adults. For young adult males, time spent in school is negatively related to time in the labor force. For four of the five years considered, more months in school are correlated with fewer hours worked and more weeks out of the labor force. For females, the effect of school attendance on labor force participation is much less evident. Only for females aged 20 are more months in school correlated with more weeks out of the labor force.

TABLE 5
Hours Worked and Weeks Out of the Labor Force: Males Aged 20 through 24

		Hours Worked		Wks. Out of Labor Force	
Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	10216.000*	10.01*	32.105*	2.40*
TEENEMP	1.583	417.480*	4.40*	-4.994*	-4.04*
HSGRAD19	0.733	860.470*	3.12*	-13.296*	-3.76*
Months in School					
Age 20	3.452	-115.560*	-2.53*	2.134*	3.64*
Age 21	2.953	-111.530*	-2.03*	1.500*	2.09*
Age 22	2.246	-34.013	-0.68	-0.450	-0.69
Age 23	1.625	-128.430*	-2.29*	1.814*	2.37*
Age 24	1.283	-124.050*	-2.49*	1.501*	2.21*
First-Born before Age 20	0.116	-711.890	-1.50	7.240	1.18
No. Household Members	1.763	-157.000	-0.83	-0.468	-0.19
No. in Household Working	0.810	345.740	0.84	-0.851	-0.16
No. Own Children					
Age 20	0.155	319.570	0.84	-10.504*	-2.00*
Age 21	0.189	-792.510	-1.73	11.597	1.93
Age 22	0.255	170.270	0.39	3.084	0.53
Age 23	0.357	161.650	0.44	-6.578	-1.39
Age 24	0.496	13.138	0.05	2.575	0.79
Real Net Income					
Age 20	11.390	4.037	0.41	0.037	0.29
Age 21	9.968	5.316	0.48	0.084	0.58
Age 22	8.625	-14.464	-1.26	0.069	0.46
Age 23	7.845	6.337	1.52	-0.101	-1.08
Age 24	9.841	3.867	1.58	0.009	0.24
Unemployment Rate	7.954	-106.600*	-2.42*	-0.716	-1.24
AFQT	44.420	3.399	0.64	0.000	0.00
Age 15 in 1979	0.410	250.700	0.84	-3.068	-0.80
Age 16 in 1979	0.397	190.320	0.61	1.349	0.34
Black Male	0.179	-291.840	-0.85	2.241	0.50

(table continues)

TABLE 5, continued

Variable	Mean of X	Hours Worked Coefficient	Hours Worked z=b/s.e.	Wks. Out of Labor Force Coefficient	Wks. Out of Labor Force z=b/s.e.
Hispanic Male	0.165	-287.340	-0.82	0.512	0.11
Health Prevents Working	0.006	-12356.000*	-4.73*	149.610*	2.85*
Married	0.271	341.510	0.37	-13.032	-1.09
Never Married	0.691	-871.830	-1.07	-0.039	0.00
Region					
North Central	0.279	-549.130	-1.83	1.430	0.37
Northeast	0.145	-2.702	-0.01	-1.855	-0.40
West	0.192	-193.640	-0.56	3.693	0.83
Poor White Oversample	0.121	-207.650	-0.59	-2.428	-0.54
Receives Military Income	0.081	-5624.800*	-11.72*	82.814*	9.93*
Urban Area	0.688	79.710	0.25	-5.858	-1.41
Mean of Dependent Variable (TOTHRSWK) = 8327.370					
Mean of Dependent Variable (TOTWKOLF) = 43.108					
Sample Size = 619					
Log-likelihood		-5707.766		-1606.931	

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

TABLE 6
Hours Worked and Weeks Out of the Labor Force: Females Aged 20 through 24

		Hours Worked		Wks. Out of Labor Force	
Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	8376.700*	10.67*	28.097*	2.25*
TEENEMP	1.319	864.970*	8.08*	-12.117*	-7.09*
HSGRAD19	0.716	918.640*	3.05*	-13.704*	-2.83*
Months in School					
Age 20	2.799	-74.743	-1.78	1.473*	2.29*
Age 21	2.190	-81.197	-1.42	0.953	1.13
Age 22	1.280	-22.203	-0.38	0.391	0.43
Age 23	0.947	-131.810	-1.94	0.706	0.68
Age 24	0.865	13.572	0.22	-0.712	-0.75
First-Born before Age 20	0.259	760.380	1.57	-8.894	-1.06
No. Household Members	1.527	-545.950*	-2.13*	3.900	0.96
No. in Household Working	0.708	1267.900*	2.35*	-11.826	-1.41
No. Own Children					
Age 20	0.363	118.010	0.25	-5.084	-0.61
Age 21	0.480	-341.920	-0.77	8.039	1.06
Age 22	0.613	-391.700	-1.00	1.192	0.19
Age 23	0.745	-686.450	-1.54	12.461	1.68
Age 24	0.856	-837.640*	-2.40*	10.966	1.90
Real Net Income					
Age 20	11.200	-9.098	-0.81	0.140	0.82
Age 21	10.900	7.417	0.60	-0.075	-0.40
Age 22	10.270	-11.447	-0.87	0.204	1.03
Age 23	12.680	0.882	0.32	-0.046	-0.88
Age 24	9.681	-17.107	-1.24	0.035	0.17
Unemployment Rate	8.197	-179.020	-3.84*	1.767*	2.36*
AFQT	38.890	7.482	1.32	0.024	0.27
Age 15 in 1979	0.373	-393.790	-1.27	5.144	1.05
Age 16 in 1979	0.415	-219.410	-0.68	4.929	0.98
Black Female	0.200	392.390	1.06	-2.580	-0.45

(table continues)

TABLE 6, continued

Variable	Mean of X	Hours Worked Coefficient	Hours Worked z=b/s.e.	Wks. Out of Labor Force Coefficient	Wks. Out of Labor Force z=b/s.e.
Hispanic Female	0.163	391.600	1.13	-2.821	-0.51
Health Prevents Working	0.024	-11868.000*	-7.75*	248.140*	5.06*
Married	0.385	-42.828	-0.08	-2.415	-0.25
Never Married	0.519	280.430	0.53	-5.665	-0.64
Region					
North Central	0.244	-754.530*	-2.37*	8.391	1.66
Northeast	0.145	-1439.300*	-3.73*	14.927*	2.49*
West	0.182	-1211.200*	-3.42*	15.223*	2.64*
Poor White Oversample	0.126	-497.840	-1.33	0.177	0.03
Receives Military Income	0.014	-6967.800*	-6.50*	80.776*	3.65*
Urban Area	0.687	223.850	0.71	-7.133	-1.44
Mean of Dependent Variable (TOTHRSWK) = 6321.206					
Mean of Dependent Variable (TOTWKOLF) = 78.012					
Sample Size = 675					
Log-likelihood		-5968.882		-1564.82	

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

In general, parenting has little effect on labor force participation at this age for either gender. Having been a teenage parent has no effect on labor force participation as a young adult. The number of own children in the household affects labor force participation for males aged 20 by reducing the number of weeks they are out of the labor force and for females aged 24 by reducing the total number of hours they work, although not weeks out of the labor force.

The number of other household members (excluding the respondent's own children) and their employment activities have no effect on the labor force participation of young adult males. But for female young adults, the presence of more household members *reduces* the total number of hours worked, whereas the presence of more working household members *increases* the number of hours worked. Real net household income does not affect labor force participation for either males or females during these ages.

The local economy affects the labor force participation of both males and females, who work fewer hours as the local unemployment rate increases. Females also are out of the labor force for more weeks as the unemployment rate increases. Only women show any regional variation in labor force participation. Young adult females from the South work more hours than similar women from other parts of the country. Women from the West and Northeast have more weeks out of the labor force than women from the South or North Central parts of the United States.

Personal characteristics affect male and female labor force participation in similar ways. Those who report that health problems prevent them from working work fewer hours and are out of the labor force more weeks. Those in the military, as measured by whether they receive income from the military, work fewer hours and have more weeks out of the (civilian) labor force. Labor force participation rates do not vary for either gender by race, ethnicity, cohort, marital status, urbanization, or AFQT score.

Labor Force Participation and Wages at Age 27: The last analyses explore the longer- term effects of teenage employment and other factors on labor force participation and wages (see Tables 7 and 8). A sample selection model based on employment status is estimated for the wage analyses to control for potential biases because wages are observed for only those respondents who are employed and for whom wages and employment status are correlated. Age 27 is chosen because of data availability.

The probit analysis based on whether an individual worked at least 1 hour during the year in which they were aged 27 indicates that few of the modeled factors are related to labor force participation when so measured. By this definition, 95.6 percent of the males and 82.1 percent of the females worked. For males, graduating from high school by age 19 and having prior work experience are both positively related to working at age 27, and health problems are negatively related. Teenage employment is not shown to have an effect. Neither do overall educational attainment, current school enrollment, household factors, the local economy, or other personal characteristics affect the probability that a male respondent works at age 27.

As with males, 27-year-old female respondents are more likely to work if they have prior work experience as a young adult (measured between ages 19 and 26, to capture all possible years), but teenage employment and graduation by age 19 are not related. Those women reporting health problems that prevented work are less likely to work, while black women are more likely to work than white or Hispanic women. Marital status, whose effect on the likelihood of working is insignificant for males, does have an effect: both married and never-married women work less than divorced, separated, or widowed women. As with males, the remaining variables in the empirical equation are statistically insignificant.

Mean wages for 27-year-old males who work are higher than those for 27-year-old women. These men average $13.58 per hour, in 1992 dollars. Women average $9.96 per hour. Education and

TABLE 7
Sample Selection Model of Labor Force Participation and Wages: Males Aged 27

		Working		Wages	
Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	-1.210	-1.88	6.290*	46.46*
TEENEMP	1.475	-0.127	-1.14	0.015	0.94
HSGRAD19	0.674	0.740*	2.62*	-0.070	-1.35
Work Experience					
Age 19 TO 26	312.300	0.009*	7.62*		
Other	173.614			0.001*	4.71*
Total Hours Worked, age 27	2042.267			0.000*	2.88*
Education					
0–8 yrs	0.040	0.956	1.84	-0.285*	-2.89*
9–11 yrs	0.123	0.214	0.70	-0.202*	-2.99*
13–15 yrs	0.174	0.189	0.51	0.090	1.84
16 or more yrs	0.213	0.236	0.56	0.376*	7.84*
School	0.108	-0.058	-0.17		
No. Household Members	1.970	-0.060	-0.77		
No. in Household Working	0.797	0.177	1.21		
No. Own Children	0.692	0.003	0.02		
Real Net Income	21.330	0.000	0.06		
Unemployment Rate	6.752	0.082	1.38	-0.014	-1.72
Age 15 in 1979	0.402	0.392	1.31	0.026	0.58
Age 16 in 1979	0.373	0.234	0.76	0.083	1.66
Black Male	0.256	-0.250	-0.90	-0.103*	-2.27*
Hispanic Male	0.174	-0.229	-0.64	-0.033	-0.63
Health Prevents Working	0.026	-1.705*	-4.56*		
Married	0.472	0.581	1.49		
Never Married	0.418	0.182	0.62		

(table continues)

TABLE 7, continued

Variable	Mean of X	Working		Wages	
		Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Region					
North Central	0.258	0.286	0.95	0.046	0.99
Northeast	0.168	-0.122	-0.39	0.195*	3.60*
West	0.194	0.274	0.72	0.101	1.88
Receives Military Income	0.023	0.461	0.61		
Urban Area	0.790	-0.127	-0.42	0.122*	2.62*
Highest wage job					
Self-employed	0.088			0.133*	2.14*
Union	0.154			0.207*	4.23*
Tenure	154.130			0.001*	4.81*
Lambda				0.045	0.25
Mean of Dependent Variable (WORKING) = 0.956					
Mean of Dependent Variable (WAGES) = 13.58; LN(WAGES) = 6.945					
Sample Size = 1059; Sample Size (WORKING = 1) = 1012					
Log-likelihood		-85.229		-802.376	

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

TABLE 8
Sample Selection Model of Labor Force Participation and Wages: Females Aged 27

		Working		Wages	
Variable	Mean of X	Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Constant	1.000	0.378	1.11	6.310*	50.16*
TEENEMP	1.228	-0.082	-1.34	0.027	1.67
HSGRAD19	0.746	0.076	0.48	-0.037	-0.76
Work Experience					
Ages 19 TO 26	268.000	0.007*	11.07*		
Other	156.396			0.000	0.61
Total Hours Worked, Age 27	1491.372			0.000*	3.11*
Education					
0–8 yrs	0.026	-0.118	-0.35	-0.093	-0.69
9–11 yrs	0.092	0.053	0.26	0.015	0.20
13–15 yrs	0.234	-0.042	-0.27	0.189*	4.83*
16 or more yrs	0.186	0.354	1.69	0.426*	9.72*
School	0.124	0.075	0.39		
No. Household Members	2.199	-0.049	-0.68		
No. in Household Working	0.795	0.028	0.21		
No. Own Children	1.185	-0.125	-1.41		
Real Net Income	24.360	-0.001	-1.78		
Unemployment Rate	6.778	-0.006	-0.25	-0.011	-1.52
Age 15 in 1979	0.381	0.076	0.48	-0.034	-0.82
Age 16 in 1979	0.400	0.116	0.72	-0.048	-1.08
Black Female	0.286	0.460*	2.66*	-0.067	-1.63
Hispanic Female	0.195	-0.102	-0.63	0.016	0.33
Health Prevents Working	0.023	-1.434*	-3.98*		
Married	0.528	-0.623*	-3.31*		
Never Married	0.305	-0.782*	-4.03*		

(table continues)

TABLE 8, continued

Variable	Mean of X	Working		Wages	
		Coefficient	z=b/s.e.	Coefficient	z=b/s.e.
Region					
North Central	0.239	-0.278	-1.80	0.017	0.39
Northeast	0.156	-0.181	-0.96	0.267*	5.64*
West	0.202	-0.075	-0.44	0.195*	4.07*
Urban Area	0.797	0.046	0.32	0.091*	2.15*
Highest-Wage Job					
Self-employed	0.065			-0.441*	-7.16*
Union	0.136			0.079	1.75
Tenure	149.849			0.001*	2.32*
Lambda				-0.257*	-2.52*
Mean of Dependent Variable (WORKING) = 0.821					
Mean of Dependent Variable (WAGES) = 9.96; LN(WAGES) = 6.721					
Sample Size = 1109; Sample Size (WORKING = 1) = 910					
Log-likelihood		-315.408		-558.04	

Source: Author's tabulation of data from the National Longitudinal Survey of Youth (NLSY) Geocode File.

*Coefficient estimate statistically significant at the 5% level.

work experience have significant, but different, effects on wages for males and females, providing mixed support for hypothesis 9. Wages for males are affected positively by greater educational attainment. Males with less than a high school education earn less per hour than those who graduated from high school. Although there is no difference in wages for male high school graduates with and without some college education, males who have a college degree or more have significantly higher wages. Young adult work experience and total hours worked at age 27 are positively related to higher hourly wages. Teenage employment and having graduated from high school are unrelated to wages at age 27 for males.

Wages for females are related to educational attainment in a different way. The difference in wages for women with only a high school diploma and women without a high school education is not significant. Women with some college experience have higher wages than women who graduated from high school, but did not attend college. All other things being the same, women who obtained a college degree or more have the highest wages. Whereas more education results in higher wages for women, more experience does not: other young adult work experience and teenage employment are not significantly related to wages for 27-year-old women. Total hours worked at age 27 are positively related to wages. As with men, high school graduation by age 19 is not related to wages for women.

The characteristics of the job whose wage is being examined are significantly related to wages for both men and women. Longer tenure on the job translates into higher wages for both genders. Being unionized improved wages for males only. Interestingly, wages are higher for males who are self-employed, but lower for females.

Personal characteristics other than the human capital measures already discussed have little effect on wages for this sample of young people. Wages do not vary by race or ethnicity for females, although black males have significantly lower wages than Hispanic or white males. Local unemployment rates do not affect wages for either gender, nor are there differences in wages across

cohorts for either gender. Wages do vary by region and urbanization, however. Women in the West and Northeast have higher wages than similar women in the South and North Central regions. Men in the Northeast have higher wages than men in the other three regions. Finally, both men and women in urban areas have higher wages than their counterparts in rural areas.

V. DISCUSSION AND CONCLUSIONS

This study sets out to answer three questions surrounding teenage employment. Do childhood family structure experiences affect whether teenagers work? What is the impact of teenage employment on the likelihood of graduating from high school "on time?" What are the long-term effects of teenage employment and timely high school graduation on young adult labor force participation and wages? Four cross-sectional analyses are performed on separate male and female cohorts of original National Longitudinal Survey of Youth (NLSY) respondents who were aged 14 through 16 at the first interview in 1979. These analyses take the fullest advantage of the longitudinal nature of the data using information from every year available, 1979 through 1993.

The first analyses examine economic and social factors related to teenage employment (number of years worked) between ages 16 and 18, using the childhood family structure model developed by Garasky (1995) to test the effect of childhood family structure experiences on the likelihood of being employed as a teenager. These experiences do not affect a teen's level of employment. Nor are other hypotheses regarding the influence of other household members on the employment patterns of teenagers supported by the analyses. A finding worthy of further consideration is the positive relationship between attendance at religious services, employment, and timely high school graduation (discussed next).

The second part of the study explores factors associated with graduating from high school by age 19. Once again, empirical estimations demonstrate that childhood family structure experiences have

limited effects on this childhood outcome. On the surface, it appears that these findings contradict Garasky (1995), who found that preschool experiences affect educational attainment later in life. Further investigation is needed to reconcile these differences, but the two studies use different measures of educational attainment that may have affected the results. Several household-level factors affect the likelihood of graduation by age 19. Specifically, for both genders, having own children in the household reduces the likelihood of timely graduation, while more household income, other than the teenager's salary and wages, increases the chances for graduation by age 19.

Bryant (1990) suggests that teenage employment may negatively affect educational attainment and performance because both activities require time, a scarce resource. These results indicate that teenage employment is positively related to graduating from high school by age 19 for both males and females. Perhaps employment experiences motivate teenagers to stay in school and graduate on time.

Analyses of young adult labor force participation patterns indicate that teenage employment patterns positively affect labor force participation later in life. Similarly, graduating from high school on time is positively related to hours worked and negatively related to weeks out of the labor force. Time spent in school after high school is negatively related to labor force participation as a young adult, although the measured effect is much more important for males than females. The human capital proposition that school and employment compete for an individual's time is supported in these analyses of young adults.

The last analyses examine labor force participation and wages across individuals at age 27, the last year of available data for the youngest cohort. At this age, work and wages are not related directly to teenage employment and timely high school graduation, but are positively related to overall levels of educational attainment and work experience, each of which is affected *indirectly* by timely high school graduation and teenage employment, respectively. Job characteristics, including union status, tenure,

and whether or not an individual is self-employed, affect significantly the wages received by both males and females, though in different ways.

To summarize, these analyses indicate that family structure experiences have limited effect on teenage employment and timely high school graduation. Thus, they offer less than was hoped for in explaining why some teenagers work while others do not. Nevertheless, this study finds considerable evidence of the positive effects of teenage employment. First, it improves the probability of high school graduation. Second, it directly relates to young adult labor force participation. Finally, it indirectly affects later work patterns and wages through cumulative employment experience and levels of educational attainment. Future research should continue to explore why it is that some teenagers work and other do not and, specifically, how teenage employment affects future adult outcomes.

APPENDIX

Data Definitions for Equations 1–5

DEPENDENT VARIABLES:

HSGRAD19: A dichotomous variable indicating whether the respondent graduated from high school by age 19 (Equation 2).

LN(WAGES): The natural logarithm of the highest hourly wage received by the respondent during the year that he/she was 27 years old (1992 dollars) (Equation 5).

TEENEMP: The number of years the respondent was employed from ages 16 through 18. The respondent had to be employed for more than 26 weeks of a year to be considered employed that year (Equation 1).

TOTAL HOURS WORKED: The sum of the total number of hours worked as reported annually by the respondent for ages 20 through 24 (Equation 3).

TOTAL WEEKS OUT OF THE LABOR FORCE: The sum of the total number of weeks out of the labor force as reported annually by the respondent for ages 20 through 24 (Equation 3).

WORKING: A dichotomous variable indicating whether the respondent worked at least one hour during the year that he/she was 27 years old (Equation 4).

EDUCATION/SCHOOLING:

INSCHOOL(16–18): Number of years the respondent was in school from ages 16 through 18 (Equation 1).

INSCHOOL(20–24): Five variables measuring the number of months the respondent attended school for each year from ages 20–24 (Equation 3).

INSCHOOL(27): An indicator variable equaling one if the respondent was in school for any part of the year he or she was 27 years old (Equation 4).

TOTAL EDUCATION: A set of four indicator variables for whether the respondent has 8 years of education or less; 9 to 11 years; 13 to 15 years; or 16 or more years at age 27. The omitted category is 12 years of education (Equations 4 and 5).

EXPERIENCE:

WORK EXPERIENCE: The total number of weeks the respondent was employed from age 19 through 26 (Equation 4).

OTHER EXPERIENCE: The total number of weeks of other employment experience the respondent has outside of the job being examined (Equation 5).

TOTAL HOURS WORKED: The total number of hours the respondent worked the year he or she was aged 27, including time spent on the highest wage job (Equation 5). By including hours spent on the highest wage job, this term also captures wage differences related to hours spent on the high wage job (e.g., part-time versus full-time wage differences).

FAMILY STRUCTURE VECTOR (all terms, Equations 1 and 2):

FATHER ONLY: An indicator variable for whether the respondent lived the majority of time in a father only family structure during the ages specified (0–3, 4–6, 7–10, 11–14 yrs).

FATHER and STEPMOTHER: An indicator variable for whether the respondent lived the majority of time in a father and stepmother family structure during the ages specified (0–3, 4–6, 7–10, 11–14 yrs).

MOTHER ONLY: An indicator variable for whether the respondent lived the majority of time in a mother only family structure during the ages specified (0–3, 4–6, 7–10, 11–14 yrs).

MOTHER and STEPFATHER: An indicator variable for whether the respondent lived the majority of time in a mother and stepfather family structure during the ages specified (0–3, 4–6, 7–10, 11–14 yrs).

OTHER FAMILY STRUCTURE: An indicator variable for whether the respondent lived the majority of time in a family structure other than with both parents and those listed during the ages specified (0–3, 4–6, 7–10, 11–14 yrs). Living with both parents is the omitted category of the analyses.

FAMILY STRUCTURE CHANGE: An indicator for whether the respondent experienced a change in family structure during the ages specified (0–3, 4–6, 7–10, 11–14 yrs).

HIGHEST WAGE JOB CHARACTERISTICS VECTOR (all terms, Equation 5):

HIGH WAGE JOB IS SELF-EMPLOYMENT: An indicator variable for whether the respondent reported that this job is self-employment.

HIGH WAGE JOB IS UNION: An indicator variable for whether the respondent reported that this job is covered by a collective bargaining agreement (i.e., is unionized).

TENURE ON HIGHEST WAGE JOB: The total number of weeks the respondent has held this job.

HOUSEHOLD CHARACTERISTICS:

FIRST-BORN BEFORE AGE 20: An indicator variable for whether the respondent became a parent before age 20 (Equation 3).

MOTHER HIGH SCHOOL GRADUATE: An indicator variable for whether the respondent's mother is a high school graduate (Equations 1 and 2).

NUMBER OF HOUSEHOLD MEMBERS: The number of other household members living with the respondent (excluding the respondent's own children), averaged over the years when the respondent was aged 16 through 18 (Equations 1–2), 20–24 (Equation 3), and 27 (Equation 4).

NUMBER OF HOUSEHOLD MEMBERS WORKING: The number of other household members living with the respondent who worked, averaged over the years when the respondent was aged 16 through 18 (Equations 1–2), 20–24 (Equation 3), and 27 (Equation 4).

NUMBER OF OWN CHILDREN: The number of the respondent's own children that lived in the same household with him or her when the respondent was aged 16 to 18 (Equations 1–2) and 27 (Equation 4). For Equation 3, this consists of five variables measuring the number of the respondent's own children that lived in the same household with him or her for each year from ages 20–24.

REAL NET INCOME: Income for the respondent's household net of the respondent's own salary and wages, averaged over the years when the respondent was aged 16 through 18 (Equations 1–2, 1979 dollars) and at age 27 (Equation 4, 1992 dollars). For Equation 3, this consists of five variables measuring net income for the respondent's household for each year from ages 20–24 (1979 dollars).

λ: The inverse Mill's ratio calculated from Equation (4) for respondents who worked during the year they were age 27.

PERSONAL CHARACTERISTICS VECTOR (X):

AFQT: Respondent's percentile score on the Armed Forces Qualification Test. The test was administered as part of the 1981 survey. Scores were revised in 1989.

AGE 15 IN 1979; AGE 16 IN 1979: Indicator variables for respondent age at the initial interview (1979). The omitted category in the analysis is age 14 in 1979.

ATTENDS RELIGIOUS SERVICES: An indicator variable for whether the respondent reported attending religious services at least infrequently during the 1979 interview.

BLACK FEMALE; HISPANIC FEMALE: Indicator variables for whether the respondent is an Hispanic female or a black female. The omitted category is being a white female.

BLACK MALE; HISPANIC MALE: Indicator variables for whether the respondent is an Hispanic male or a black male. The omitted category is being a white male.

HEALTH PREVENTS WORKING: An indicator variable for whether the respondent reported health problems prevented him or her from working averaged over the years when the respondent was aged 20–24 (Equation 3) and at age 27 (Equation 4).

MARRIED; NEVER MARRIED: Indicator variables for whether the respondent was married or never married averaged over the years when the respondent was aged 20–24 (Equation 3) and at age 27 (Equation 4). The omitted category is any other marital status (i.e., divorced, separated, or widowed).

NORTH CENTRAL; NORTHEAST; WEST: Indicator variables for whether the respondent lived in the Northeastern, North Central, or Western part of the United States averaged over the years when the respondent was aged 16–18 (Equations 1–2), 20–24 (Equation 3), and at age 27 (Equations 4–5). The omitted category is living in the South.

POOR WHITE OVERSAMPLE: An indicator variable for whether the respondent was part of the original oversampling of economically disadvantaged white respondents.

RECEIVES MILITARY INCOME: An indicator variable for whether the respondent received military income, averaged over the years when the respondent was aged 20–24 (Equation 3) and age 27 (Equation 4). Note: all females who received military income at age 27 also worked (WORKING = 1). Therefore, this variable could not be included in the female labor force participation equation (Equation 4).

URBAN: An indicator variable for whether the respondent lived in an urban area averaged over the years when the respondent was aged 16–18 (Equations 1–2) and 20–24 (Equation 3); and at age 27 (Equations 4–5). The omitted category is living in a rural area.

UNEMPLOYMENT RATE: The local unemployment rate for the area in which the respondent lived averaged over the years when the respondent was aged 16–18 (Equations 1–2), 20–24 (Equation 3), and at age 27 (Equations 4–5).

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