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The Changing Benefits of Early Work Experience

Charles L. Baum* and Christopher J. Ruhm†

We examine whether the benefits of high school work experience have changed over the last 20 years by comparing effects for the 1979 and 1997 cohorts of the National Longitudinal Survey of Youth. Our main specifications suggest that the future annual earnings benefits of working 20 h per week in the senior year of high school have fallen from 17.4% for the earlier cohort, measured in 1987–1989, to 12.1% for the later cohort, in 2008–2010. The gains have diminished by similar amounts for men and women but much more substantially for those who do not later attend college than for those who do. We further show that most of the differential between cohorts can be attributed to the way that high school employment is related to subsequent adult work experience and occupational attainment.

JEL Classification: J13, J24, J31

1. Introduction and Background

Early work experience in high school, by facilitating the transition from school to the labor force, is often believed to be important for later economic success (Bailey 1995; Osterman 1995; Poczik 1995; Bishop 1996). Students who are employed in high school may enhance their future labor market prospects and earnings potential by learning work-related skills and forging contacts with employers. In addition, the impact of early work experience on earnings may have increased as the return to skill has risen (Oettinger 1999). Alternatively, intensive early work experience could be detrimental to later economic success, in part because it harms academic performance, like high school graduation and college attendance rates (Greenberger and Steinberg 1986; Staff, Schulenberg, and Bachman 2010; Monahan, Lee, and Steinberg 2011). Understanding the effects of early work experience is important in its own right, and even more so because the prevalence of high school employment decreased rapidly during the first decade of the 21st century. For example, analysis of Current Population Survey data by the National Center for Education Statistics (2012) reveals that the employment rate of high school students (aged 16 and older) remained roughly constant (at around 32%) during the 1990s, but decreased rapidly after 2000, such that only 16% were employed in 2010. Possible reasons for the decline include the Great Recession, increased competition for jobs from immigrants, former welfare recipients and other adults, and an increased emphasis on education or in the availability of financial aid for college

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(Gottschalk and Hansen 2003; Astone, Hao, and Cherlin 2004; Aaronson, Park, and Sullivan 2006; Sum, Harrington, and Khatiwada 2006; Smith 2011, 2012).

We address these issues by using data from two cohorts of the National Longitudinal Survey of Youth (NLSY) to study how the employment of high school students, particularly seniors, is related to subsequent labor market outcomes. Most previous research uses data for the 1979 cohort of the NLSY (NLSY79). We supplement this with information from the 1997 cohort (NLSY97), which includes youths who were in high school around the turn of the millennium. In addition to examining how the associations between student employment and future labor market outcomes have shifted over time, we attempt to identify the reasons for the changes. Our main finding is that the future labor market benefits of working during the senior year of high school have fallen over time. For example, the average annual earnings premium from 20 weekly hours of senior work experience (compared to not working at all) is 44% larger for NLSY79 respondents in 1987–1989 (17.4%) than for their NLSY97 counterparts in 2008–2010 (12.1%). This reflects differentials in both employment levels and hourly wages, and largely operates through effects on future labor market experience and occupational attainment. Specifically, the data suggest that senior year employment lowered the probabilities of subsequently working in the relatively low-paid service sector for the 1979 cohort but possibly increased them for the 1997 cohort. In addition, higher school work had a smaller estimated positive effect on future work experience and job tenure for the later group, and the returns to experience have also trended downwards. Conversely, changes in the effects of high school employment on subsequent educational attainment do not play much of a role.

2. Theory and Existing Evidence

The human capital, signaling, and occupational socialization models all identify conditions under which adult wages will be enhanced by high school employment. In the human capital model (Mincer 1974; Becker 1975), high school work experience might improve future labor market outcomes because employed students acquire skills and knowledge that increase their productivity. Stern and Nakata (1989) further argue that early work experience develops on-the-job learning skills, which are becoming more important with technological change, increased employee decision-making, and the economy's shift from high-volume manufacturing to low-volume specialized production. In the screening model (Arrow 1973; Spence 1973), market work in high school might be seen as a signal of high labor productivity. Such effects will be reinforced if, as predicted by the occupational socialization model, student employment promotes favorable work attitudes, stronger work orientation, higher self-reliance, better time management skills, or positive self-concepts (Mortimer and Finch 1986; Steel 1991).

Alternatively, working in high school might have negative effects. For instance, it could decrease cognitive skill accumulation by reducing educational attainment, as proxied by high school GPA, dropout or graduation rates, and college attendance (Greenberger and Steinberg 1986). This could occur partly because it decreases the time available for studying (Kalenkoski and Pabilonia 2009, 2012) or increases stress or exhaustion (Steinberg, Fegley, and Dornbusch 1993).

Most previous research finds that high school employment enhances future employment opportunities and increases wages (Stephenson 1981; Meyer and Wise 1982; Mortimer and Finch

1986; Stern and Nakata 1989; Marsh 1991; Steel 1991; Carr, Wright, and Brody 1996; Ruhm 1997; Light 1999, 2001; Hotz et al. 2002).[1] Ruhm (1997) shows that work during the senior year has positive effects on future hourly and annual earnings, fringe benefits (e.g., retirement pensions and health insurance), and occupation status measured six to nine years later. Meyer and Wise (1982) find that post-high school annual employment increases by 1.5 weeks and wages by 5–9% for every five additional hours per week of high school work. Light (1999) indicates that high school employment raises wages for the first six years after graduation—by 6% for working 25 h per week, versus not working—but with the effects disappearing by seven or eight years subsequent to it. Light (2001) demonstrates that two years of in-school employment raise the wages of college graduates by 10–18%. Carr, Wright, and Brody (1996) estimate that high school employment increases labor force participation, employment, and income measured 10 years later. Conversely, Hotz et al. (2002) conclude that the positive effects of high school work on wages found in the literature are due to unobserved heterogeneity. However, Light (2001) believes that this is because Hotz et al. (2002) examine whether or not students work but not differences in work intensities.

Other studies investigate the effects on educational performance during high school. Early research (e.g., Greenberger and Steinberg 1980; Steinberg et al. 1982a, b; Mortimer and Finch 1986; Marsh 1991; Steinberg and Dornbusch 1991; Steinberg, Fegley, and Dornbusch 1993) shows that high school hours have detrimental effects on multiple measures of academic achievement, particularly for students working more than 20 h per week. Some later investigations concur (Carr, Wright, and Brody 1996; Eckstein and Wolpin 1999; Oettinger 1999; Tyler 2003), while others find that modest amounts of work may have positive consequences (D'Amico 1984; Schill, McCartin, and Meyer 1985; Lillydahl 1990; Steel 1991; Mortimer et al. 1996; DeSimone 2006), no impact (Gottfredson 1985; Montmarquette, Viennot-Briot, and Dagenais 2007; Sabia 2009; Lee and Orazem 2010; Buscha et al. 2011), or that estimated "effects" are primarily due to unobserved characteristics such as preexisting preferences for work over school (Schoenhals, Tienda, and Schneider 1998; Warren, LePore, and Mare 2000; Warren 2002; Bachman et al. 2003, 2008, 2011; Warren and Lee 2003; Rothstein 2007; Staff, Schulenberg, and Bachman 2010).[2]

3. Data

Data are from the 1979 and 1997 cohorts of the National Longitudinal Survey of Youth (NLSY79 and NLSY97). The NLSY is well-suited for our purposes because it collects detailed information about the employment experiences and background characteristics of high school students, as well as on their subsequent labor market outcomes. From 1979 through 1994, the NLSY79 annually interviewed a cohort of respondents aged 14–21 in 1979. After 1994, the NLSY79 switched to biennial interviews. The original NLSY79 sample contained 12,686

[1] Stern, Finkelstein, Urquiola, and Cagampang (1997) differentiate "co-op" versus "non-school-supervised" work, and argue that the negative effects on high school grades are larger for the latter jobs. Neumark and Joyce (2001) use NLSY97 data to study the effects of school-to-work programs on school enrollment, employment, work hours, wages, educational attainment and expectations of future education and employment and. They uncover little effect on most outcomes, although their results must be interpreted cautiously because data are from the 1997 wave when respondents were roughly 12–16 years of age and many of the outcomes were seldom observed.

[2] In related work, Ehrenberg and Sherman (1987), Stinebrickner and Stinebrickner (2003), and Arano and Parker (2008) examine the effects of college employment.

individuals, including 6283 females and oversamples of blacks, Hispanics, low-income whites, and military personnel. The military sample was dropped in 1984 and the low-income white sample in 1990. We exclude both from our analysis. The NLSY97 began annually interviewing 8984 youths, aged 12 through 16 on January 1, 1997, and is ongoing. The original sample contained 6748 nationally representative observations and an oversample of 2236 black and Hispanic respondents. The labor market outcomes upon which we focus are measured in 1987–1989 for the NLSY79 cohort and from 2008 to 2010 for their NLSY97 counterparts. Further details are provided below.

High School Employment

The NLSY identifies labor force status in each week covered by the surveys. Respondents report being employed, unemployed, or out of the labor force and the number of weekly hours worked (if employed).[3] Following Ruhm (1997), we use the months of October, November, February, March, April, and May for academic-year work experience, to avoid employment during times out of school (e.g., Christmas or summer breaks). Where possible, we also identify employment during the sophomore, junior, and senior high school grades, but most of our analysis focuses on senior year work, because smaller or nonexistent effects are observed in lower grades. Our primary specifications examine average weekly employment hours during the academic year but we also consider nonlinearities in the effects, as well as employment during the summer between the junior and senior years (defined, following Ruhm (1997), as the eight-week period beginning July 1). We top-code academic year work hours at 40.[4]

The youngest NLSY97 respondents (who were 12 years old in 1997) were in high school from approximately 1999 through 2003 and the oldest (aged 17 in 1997) from about 1994 through 1998. Thus, high school work experience for this cohort occurred from approximately 1994 through 2003, but was only observed starting in 1997. The youngest NLSY79 respondents (14 years old in 1979) were in high school from approximately 1981 through 1985 and the oldest (aged 21 in 1979) from about 1972 through 1976. The NLSY79 work history begins in 1978, so that high school work experiences for the 1979-cohort are available from 1978 through 1985. We examine labor market experiences at least five years after graduation, or from 2008 to 2010 for NLSY97 respondents (requiring high school graduation no later than 2003) and from 1987 to 1989 for NLSY79 respondents (requiring high school graduation no later than 1982).

We cannot always identify work experience during each year of high school. Most frequently, this occurs because the individual began high school before the start of the NLSY survey (e.g., prior to 1979 for NLSY79 respondents). Since our primary focus will be on employment during the

[3] Beginning in 1994, the NLSY97 identifies distinguishes work at "employee-type" jobs from "freelance-type" jobs. Since the NLSY79 does not make this distinction, our estimates may mask heterogeneous employment effects, particularly for younger students if they are the ones most likely to babysit, cut grass, and so on.

[4] An alternative to the work history data is to use status in the week prior to the survey. Ruhm (1997) prefers the accuracy of reference week measures and supplies evidence that hours worked in recall data are often overstated. However, Rothstein (2007) points out that recall data covers the entire academic (or summer) period, noting that since hours tend to increase over the academic year, reference week work hours may be unduly influenced by the interview date. Work history data also allows academic year and summer work hours to be compared. We use the recall data throughout, in part because survey-week work hours are only collected in the 1997, 2000, and 2006 NLSY97 surveys. As in Ruhm (1997), the NLSY work histories indicate work hours that are approximately 10–15% higher than those for the corresponding survey-week. To explore how this influences the results, we re-estimated the preferred log earnings models using reference week work hours. These yielded similar estimates that were less precise due to smaller samples.

Table 1. Descriptive Statistics on High School Work Experience

	NLSY79	NLSY97
Ever Employed During High School	0.817	0.847
	(0.006)	(0.005)
Sophomore Work Hours (average hours per week)	4.704	4.835
	(0.189)	(0.157)
Junior Work Hours (average hours per week)	8.377	9.236
	(0.188)	(0.168)
Senior Work Hours (average hours per week)	13.325	13.810
	(0.200)	(0.198)
Senior Hours: 0 per week	0.252	0.239
	(0.007)	(0.006)
Senior Hours: 1–10 per week	0.209	0.217
	(0.006)	(0.006)
Senior Hours: 10–20 per week	0.234	0.234
	(0.007)	(0.006)
Senior Hours: >20 per week	0.302	0.307
	(0.007)	(0.007)
Senior Weeks Worked (proportion)	0.559	0.592
	(0.007)	(0.006)
Summer Hours (average hours per week)	20.048	19.047
	(0.261)	(0.244)
Sample Size	3637	3925

Weighted means are provided with standard errors in parentheses. Summer work hours refer to the summer between the junior and senior year of high school.

senior grade, we include such persons in most of the analysis (provided that we have data on senior year work hours for them), under the assumption that it is random whether a respondent's time in high school completely overlaps with the NLSY survey period (e.g., whether a NLSY79 respondent was 12 or 16 in 1979) and because we are reluctant to discard potentially useful information. However, we also conducted sensitivity analysis limiting the sample to those for whom we have employment data in each high school year.

Table 1 presents descriptive statistics on high school work experience. Most students (82% of NLSY79 respondents and 85% of the NLSY97 sample) were employed at some point during high school. Average weekly work hours increased with high school grade from less than 5 per week for sophomores to 13 or 14 per week for seniors. Students worked more during the summer between the junior and senior year than during either academic year. Three-quarters worked at some point during the senior year and 30% for more than 20 h per week. The overall prevalence of high school work may have increased slightly across NLSY cohorts.[5]

Adult Labor Market Outcomes

Our primary dependent variable is the natural log of annual earnings measured when respondents are 23–29 years old (or around 5–11 years after the expected date of high school graduation). Earnings include income from wages, salary, commissions, overtime, bonuses and incentive pay. We

[5] These statistics are similar to those provided by Ruhm (1997) for the NLSY79 and Rothstein (2007) for the NLSY97, although both use slightly different sample selection criteria. They do not capture the subsequent decline in high school employment mentioned in the introduction.

Table 2. Descriptive Statistics on Subsequent Labor Market Outcomes

	NLSY79 (1987–1989)	NLSY97 (2008–2010)
Annual Earnings (thousands of dollars)	30.418 (0.304)	31.296 (0.307)
Annual Weeks Worked	41.740 (0.257)	40.928 (0.260)
Weekly Hours Worked (annual hours/52)	32.313 (0.241)	30.296 (0.239)
Annual Weeks Unemployed	1.656 (0.069)	3.010 (0.106)
Weekly Wages (dollars)	652.559 (6.237)	725.099 (12.371)
Hourly Wages (dollars)	16.567 (0.163)	20.645 (0.675)
Medical Benefits (=1 if in receipt)	0.759 (0.007)	0.716 (0.006)
Retirement Benefits (=1 if in receipt)	0.564 (0.007)	0.539 (0.007)
Education (in years)	13.627 (0.039)	14.617 (0.036)
College Degree (=1 if college education)	0.268 (0.008)	0.416 (0.007)
Sample Size	3637	3925

Weighted means are provided with standard errors in parentheses. Dollar figures are adjusted for inflation to year-2012 dollars. Adult economic outcomes are averaged over the indicated three-survey year period.

also analyze supplementary outcomes including: (i) annual weeks and hours worked, (ii) annual weeks unemployed, (iii) the log of weekly and hourly earnings, and (iv) the receipt of medical insurance and retirement or pension benefits. All dollar figures are adjusted for inflation, using the CPI, to year-2012 dollars. Annual weeks and hours worked and weeks unemployed are calculated on a *calendar-year* basis, using data reported during the following year's survey (e.g., data for 2010 are obtained from the 2011 wave of the NLSY97). Hourly and weekly wages are calculated as annual earnings divided by hours or weeks worked during the calendar year. The NLSY surveys provide additional information on jobs held at the time of the interview, which is used to create the survey year hourly wage and employment benefits measures. We average adult labor market outcomes across three survey waves or calendar years—the 2008–2010 for NLSY97 respondents and the 1987–1989 for NLSY79 sample—to smooth temporary fluctuations. When data are missing for one of the three years, we average over the two remaining surveys to avoid losing observations.

As shown in Table 2, annual earnings are around 3% higher for the later (NLSY97) than earlier (NLSY79) cohort, with higher wage rates being offset by reductions in work hours, partially due to higher county unemployment rates. The receipt of health insurance and retirement/pension plan benefits has trended slightly downwards at the same time education increased.

Table 3 shows the association between senior year high school employment and selected future labor market outcomes: annual earnings, annual hours worked, and hourly wages, with the data weighted so as to provide nationally representative results. We divided senior grade employment into categories—0, 1–10, 11–20, and >20 h—and did the same for work during the summer prior to the senior year. Adult earnings, hours worked, and hourly wages are typically lowest for those who did not work as students during the academic year and highest for those who worked long hours. However, this gradient has weakened over time, suggesting a lower return to student employment in recent years. Summer employment also positively correlates with future earnings, work hours, and hourly wages, with gradients that appear very similar to those for employment during the senior school year.

4. Empirical Specification

We use multivariate regression to explore the predicted effect of early work experience on adult labor market outcomes (Y_i), primarily log annual earnings, which are measured for

Table 3. Associations Between Student Work Experience and Subsequent Labor Market Outcomes

	NLSY79 (1987–1989)				NLSY97 (2008–2010)			
Early Work Experience	*N*	Earnings	Hours	Hourly Wages	*N*	Earnings	Hours	Hourly Wages
Senior Hours = 0	1133	25.832	28.912	14.026	1047	30.015	28.676	15.148
Senior Hours = (0–10]	366	29.962	31.038	15.555	420	29.728	28.696	15.510
Senior Hours = (10–20]	1161	30.446	32.606	15.609	1284	31.898	30.662	15.490
Senior Hours = (20–∞]	977	34.137	35.269	16.725	1174	32.109	31.704	15.344
Summer Hours = 0	1183	24.562	27.877	13.682	1118	28.852	26.567	14.841
Summer Hours = (0–10]	121	27.337	29.991	15.183	176	29.571	28.175	15.140
Summer Hours = (10–20]	689	31.954	33.285	15.944	897	31.403	31.104	15.279
Summer Hours = (20–∞]	1640	33.003	34.478	16.386	1725	32.670	32.175	15.694
Sample Size			3637				3925	

Weighted means are provided. *N* is number of observations in a particular early work experience category. Table displays annual earnings in thousands of dollars, average weekly work hours calculated as annual hours divided by 52 weeks, and hourly wages. All of these are in 2012-year dollars and averaged over the indicated three-survey year period.

respondent *i*. The key explanatory variables are early employment experiences (E_i). Formally, we estimate

$$Y_i = \beta_0 + \boldsymbol{\beta}_1 \mathbf{X}_i + \beta_2 E_i + \varepsilon_i, \tag{1}$$

where *X*, in the basic model, includes standard demographic controls for gender, race/ethnicity, age, marital status, family size, cigarette smoking, body mass index (BMI), region of residence, and urbanicity. The time-varying demographic characteristics (e.g., family size and region of residence) are measured during adulthood and included in all models; some specifications contain additional covariates. Descriptive statistics for selected demographic characteristics are supplied in Appendix. To prevent sample loss from missing values for covariates that are not the primary focus of our analysis, we generate a dummy variable for each such regressor that equals one when the data are missing or incomplete, with that covariate then coded with a zero (e.g., see Tyler 2003). We exclude from our basic model controls for adult occupation, education, work experience, and tenure, since high school employment may affect adult labor market outcomes through such factors. Subsequent specifications include controls for these potential mediating mechanisms.

High school employment is unlikely to occur randomly. Ideally, the supplementary covariates account for this selection process; however, the estimates may be biased if they do not. For example, if working high school students have relatively low levels of academic ability, the estimated effect of early employment on later earnings is likely to be biased downwards. Our primary strategy for minimizing this potential heterogeneity is to include successively more detailed controls for family background, student ability, and school characteristics that might reflect differences between high school students who are and are not employed. The characteristics available vary somewhat between the NLSY79 and NLSY97: the former contains more comprehensive family background information and the latter more detailed information about school characteristics and experiences. The vector of family background characteristics in our regressions always includes education of the respondent's mother and father, living with both parents at age 14, whether English was spoken at home, town size, and religious affiliation. Church attendance and number of siblings are included for NLSY79 respondents as are controls for foreign-born parents and whether the household

Table 4. Regression-Adjusted Estimated Effects of Early Work Experience on Log Annual Earnings

	Model 1	Model 2	Model 3	Model 4	Model 5
Time Period			NLSY79 Respondents in 1987–1989		
Senior Hours	0.210***	0.151***	0.154***	0.160***	0.160***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
			NLSY97 Respondents in 2008–2010		
Senior Hours	0.091***	0.089***	0.100***	0.113***	0.114***
	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)
Difference	0.119***	0.062*	0.054*	0.047	0.046
	(0.033)	(0.032)	(0.032)	(0.032)	(0.032)
Covariates					
Demographic		X	X	X	X
Family			X	X	X
Ability				X	X
School					X

The table shows estimated coefficients on weekly senior grade work hours divided by 20. Standard errors are in parentheses and are clustered at the sibling level. Difference refers to the difference between the senior year work hours coefficients for the NLSY79 versus the NLSY97 cohort. The demographic covariates include controls for gender, race/ethnicity, age, marital status, family size, region of residence, urbanicity, the current county unemployment rate, and the lowest county unemployment rate. The family background characteristics include mother's and father's education, living with both parents, whether English was spoken, town size, in both cohorts, as well as religious affiliation, and church attendance in the NLSY97 and whether the household had a magazine subscription, took a newspaper, had a library card, and the number of siblings in the NLSY79. Ability for NLSY97 respondents is the ASVAB score and for NLSY79 respondents is the AFQT score. We also include eighth grade GPA as an ability measure for NLSY97 respondents. The covariate block of school characteristics and experiences includes the student's high school program of study (general, college preparatory, vocational, or combination), number of math and science courses taken, school type (public, private, or parochial), size, and student-teacher ratio for NLSY97 respondents. For the NLSY79 sample, this includes program of study (vocational, commercial, college preparatory, or general), school type (public or private), and student perceptions of boredom, safety, and satisfaction with school. The school experiences vector contains measures of cigarette-smoking and body mass index (BMI) for both NLSY samples. Annual earnings are measured in logs and are averaged over three survey years. Sample sizes are 3279 for the NLSY97 cohort and 3487 for the NLSY97.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

had magazine or newspaper subscriptions. Ability is measured by the Armed Services Vocational Aptitude Battery (ASVAB) test score for the NLSY97 and the Armed Forces Qualifications Test (AFQT) score for the NLSY79. Eighth-grade GPA is included as an ability measure for NLSY97 respondents. The school characteristic controls include: type of high school program (general, college preparatory, vocational, or combination); number of math and science courses taken; school type (public, private, or parochial) and size; and the school's student-teacher ratio. For the NLSY79, the school controls are: program of study (vocational, commercial, college preparatory, or general); school type (public or private); and student perceptions of boredom, safety, and satisfaction with school.

5. The Benefits of High School Employment Have Declined Over Time

We begin our empirical analysis by examining the effect of hours worked during the senior year on log annual earnings in adulthood (see Table 4). We follow much of the previous literature by focusing on work by high school seniors and show below that this is where the predicted student

Table 5. Alternative Regression-Adjusted Estimated Effects of Early Work Experience on Log Annual Earnings

	NLSY79 (1987–1989)	NLSY97 (2008–2010)
Model 1		
Sophomore Hours	0.053 (0.052)	−0.041 (0.041)
Junior Hours	−0.048 (0.052)	0.034 (0.038)
Senior Hours	0.196*** (0.041)	0.091*** (0.029)
Model 2		
Senior Hours	0.236*** (0.072)	0.201*** (0.072)
Senior Hours Squared	−0.046 (0.040)	−0.051 (0.039)
p-Value	0.001	0.001
Model 3		
Senior Hours: 1–10	0.084** (0.043)	0.050 (0.042)
Senior Hours:11–20	0.181*** (0.040)	0.110** (0.043)
Senior Hours: >20	0.256*** (0.040)	0.176*** (0.038)
p-Value	0.001	0.001
Model 4		
Senior Hours	0.118*** (0.026)	0.077*** (0.027)
Summer Hours	0.072*** (0.020)	0.058** (0.024)

Table shows estimated coefficients on the indicated early work experience covariates. The models include the demographic, family, ability, and school covariates. Dollar figures are adjusted for inflation to year-2012 dollars. Annual earnings are in logs and averaged over three survey years. Sample sizes for NLSY79 and NLSY97 respondents are 1547 and 2480 in model 1 and 3279 and 3487 in models 2 through 4. Standard errors are in parentheses and are clustered at the sibling level. *P*-values refer to the hypothesis that the coefficients on senior hours are jointly equal to zero.

*** $p < 0.01$.

** $p < 0.05$.

[a]* $p < 0.1$.

employment effects are the strongest. Model 1 provides results for a specification that contains no covariates other than senior year work hours. Controls for demographic covariates, family background characteristics, ability, and school characteristics are successively added in models 2 through 5, with the last of these (which includes the full set of covariates) being focused upon in most of the subsequent analysis. Senior hours are calculated on a weekly basis and divided by 20, so that a one-unit change corresponds to working an additional 20 h per week during the high school senior year. Difference refers to the change in the senior year employment coefficient between the NLSY79 and NLSY97 cohorts.

For the 1979 cohort, senior work hours are positively and significantly correlated with future earnings, with little change in the parameter estimates occurring once the basic set of demographic characteristics (in model 2) has been controlled for. Predicted effects of senior work hours for the 1997 cohort are smaller but remain statistically significant (at the 1% level) in all models. Interestingly, for this group the inclusion of additional regression controls either has no effect on or raises the estimated earnings gain associated with senior year work experience. In specifications that include all covariates (model 5), the positive predicted effect of 20 h per week of senior year employment on future incomes is 44% larger for the NLSY79 than for the NLSY97 cohort (17.4 vs. 12.1%). The difference between these two predicted effects is significant at the 10 (but not 5)% level, with a *t*-statistic of 1.63.

Table 5 presents results using different specifications of high school work experience. Model 1 controls for weekly employment hours during the sophomore and junior, as well as the senior, years. We do not include a corresponding covariate for the freshman year because few freshmen work. Sophomore and junior work hours have statistically insignificant effects for both cohorts

and the point estimates are fairly small, suggesting that working 20 h changes future earnings by −4.7 to 5.4%. The positive predicted effect of senior year employment is somewhat attenuated for the NLSY97 sample and the secular decline becomes somewhat larger: 20 h per week of senior year employment is predicted to raise future earnings by 21.7% for the NLSY79 cohort versus 9.5% for their NLSY97 counterparts. These results suggest that our estimates may understate the changes occurring over time in the effects of employment by high school seniors.

Model 2 allows for nonlinearities by including a quadratic in senior year work-hours. The hours-squared term is statistically insignificant for both cohorts, justifying our use of linear controls for work hours in most of the analysis. Nevertheless, the point estimates suggest that the gains to working are concave, with earnings increasing monotonically in high school work hours (until the latter get extremely long) but at a diminishing rate. In the third panel, senior year employment is categorized into >0 to 10, >10 to 20, and >20 h per week, with no work the excluded reference group. Once again, adult earnings increase in senior year work hours, and with suggestive evidence of modest nonlinearities in the predicted effects. Despite this, little is lost by estimating linear models, and since these are far easier to interpret, we focus on them in much of the remaining analysis.

The final panel of Table 5 controls for summer (before the senior year) as well as academic year employment. The former has a statistically significant positive predicted effect on earnings for both cohorts, but the estimated differentials are always smaller than for working during the senior year. As with school year employment, the return to summer work may have declined over time.

Robustness and Sensitivity Tests

Our main analysis sample includes unbalanced data from both the representative and supplemental NLSY subsamples, with sampling weights incorporated in the regressions. We next explored the implications of each of these choices. The first model in Table 6 repeats our estimates for the

Table 6. Regression-Adjusted Estimated Effects of Early Work Experience on Annual Earnings: Robustness Tests

	Model 1: Original Results	Model 2: Balanced Sample	Model 3: Nationally Representative Sample	Model 4: No Weights	Model 5: Males	Model 6: Females
			NLSY79 Respondents in 1987–1989			
Senior Hours	0.160***	0.185***	0.154***	0.163***	0.157***	0.162***
	(0.024)	(0.035)	(0.026)	(0.021)	(0.027)	(0.040)
Observations	3279	1547	2128	3279	1626	1653
			NLSY97 Respondents in 2008–2010			
Senior Hours	0.114***	0.129***	0.107***	0.121***	0.103***	0.109***
	(0.022)	(0.026)	(0.024)	(0.020)	(0.028)	(0.034)
Observations	3487	2480	2729	3487	1761	1726

Table shows estimated coefficients on weekly senior year work hours divided by 20. Models include the demographic, family, ability, and school covariates. Standard errors are in parentheses and are clustered at the sibling level. Dollar figures are adjusted for inflation to year-2012 dollars. Annual earnings are in logs and averaged over three survey years. The balanced sample refers to persons for which employment data are available during the sophomore through senior years of high school.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

preferred specification (model 5 of Table 4), for ease of comparison. Specification 2 uses a balanced sample, consisting of respondents providing valid work experience information for all high school years. While these samples are substantially smaller, we nevertheless find significant, positive effects for both cohorts, and with somewhat larger point estimates and a slightly greater secular decline in the return to senior year work: 20 extra hours of weekly work predicts an earnings premium of 20.3% for the NLSY79 balanced sample and 13.8% for NLSY97 respondents. In model 3, we restrict our analysis to the nationally representative cross sections (i.e., excluding the supplemental black and Hispanic oversamples) and in model 4 we do not weight the data. Neither of these alternatives appreciably changes the results. Finally, models 5 and 6 show that the returns to senior year employment, and the associated changes over time, are quite similar for males and females.

We explored potential biases in the preceding results using an instrumental variables (IV) strategy, where high school employment was predicted by local labor market conditions during the high school years (Ruhm 1997; Light 1999; Hoynes 2000; Neumark 2002). The instruments included lowest previous and current county unemployment rates (Beaudry and DiNardo 1991), various population and density measures, the age distribution, percent with a high school education and college education, and per capital income, using data from the NLSY's restricted geography-coded data, which we obtained permission to use.[6] However, our first-stage estimates suffered from a "weak instruments problem" (Bound, Jaeger, and Baker 1995; Staiger and Stock 1997), with *F*-statistics ranging between 4 and 6, and Hausman tests failed to reject the null hypothesis that the same coefficient was obtained from OLS and IV models. We also estimated sibling-specific fixed effects models and obtained mixed results—beneficial estimates for student employment for the earlier but not the later cohort. However, only around 20% of the NLSY samples have a surveyed sibling, and this group may be highly selected. Given these issues, we focus the remainder of our analysis on OLS estimates.

Nonwage Outcomes

We next examine components of the declining returns to high school employment, as well as related labor market outcomes such as the probability of being unemployed or receiving nonwage compensation. Table 7 summarizes the findings. Model 1 repeats our preferred specification for log annual earnings. Models 2 and 3 examine weeks and hours of work during the previous calendar year. Senior year employment is predicted to raise both of these but by larger amounts for the earlier cohort. For example, working 20 h per week predicts a 2.9 h increase in subsequent weekly hours for the NLSY79 sample compared to a 1.9 h for the NLSY97 cohort. High school employment also reduces weeks unemployed as an adult but again more so for the earlier cohort. Models 5 and 6 consider weekly and hourly wages. Because student employment increases subsequent work hours, it is no surprise that expected log weekly wages also grow. However, 20 h of senior year work also predict a statistically significant 6.6% rise in hourly wages for the NLSY79 sample and a 5.7% increase for their NLSY97 counterparts. In combination, these results suggest that most, but not all, of the overall earnings effect operates through changes in work hours, rather than in hourly wages.

Finally, models 7 and 8 show that senior grade employment is associated with higher future levels of fringe benefit receipt on the main job and that the predicted effect has declined over time

[6] Additionally, we followed Neumark (2002) in estimating models that controlled for cohort average unemployment rates, which may be less susceptible to bias caused by endogenous migration.

Table 7. Regression-Adjusted Estimated Effects of Early Work Experience on Adult Labor Market Outcomes

	Model 1: Log Annual Wages	Model 2: Annual Weeks Worked	Model 3: Weekly Hours Worked	Model 4: Annual Weeks Unem-ployed	Model 5: Log Weekly Wage	Model 6: Log Hourly Wage	Model 7: Health Benefits	Model 8: Retirement Benefits
				NLSY79 Respondents in 1987–1989				
Senior Hours	0.160***	2.785***	2.917***	−0.713***	0.104***	0.064***	0.063***	0.043***
	(0.024)	(0.447)	(0.402)	(0.119)	(0.020)	(0.017)	(0.012)	(0.016)
Observations	3279	3637	3637	3637	3260	3260	3194	3031
				NLSY97 Respondents in 2008–2010				
Senior Hours	0.114***	1.867***	1.929***	−0.410**	0.084***	0.055***	0.036***	0.036***
	(0.022)	(0.439)	(0.408)	(0.191)	(0.019)	(0.018)	(0.012)	(0.013)
Observations	3487	3925	3925	3925	3329	3316	3418	3418

Table shows estimated coefficients on weekly senior year work hours divided by 20. Standard errors are in parentheses and are clustered at the sibling level. Models include the demographic, family, ability, and school covariates. Dollar figures are adjusted for inflation to year-2012 dollars. Annual earnings and wages are in logs. Hours worked is annual hours divided by 52. Health and retirement benefits equal the probability of receipt at the adult job held at the time of the survey. All economic outcomes are averaged over three survey years. Binary outcomes are estimated using linear probability models.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

for health insurance, but less so if at all for pension benefits. To put the magnitudes of these effects into perspective, 20 h per week of work in the senior high school year is predicted to raise the probability of receiving health insurance from employers by 6.3 and 3.6% points, for the NLSY79 and NLSY97 samples, compared to sample averages of 76 and 72%. Pension receipt is predicted to increase 4.3 and 3.6 points from baselines of 56 and 54%.

6. Why Has the Benefit to Early Work Experience Decreased?

We next provide information on possible reasons why the future labor market benefits of high school work experience have decreased over time. To do so, we examine the roles of potential mediating factors including: occupational attainment, college attendance and graduation, post high school work experience, job tenure, and the probability that the individual remains in the same job held during the high school senior year.[7] As a first step, we estimate how senior year employment is related to each of these potential mechanisms. Here and below, we restrict the set of controls to those that are common to both cohorts. These include gender, race/ethnicity, age, marital status, family size, cigarette smoking, BMI, region of residence, urban residence, the current and lowest unemployment rates, maternal and paternal education, living with both parents, native language, and religion.

The results, summarized in Table 8, show that there have been relatively small changes in most cases. Senior year employment is positively related to blue collar employment, post-high school experience, adult tenure, and the probability of remaining in the senior year job for both cohorts, although the last three associations may have weakened over time. The most important difference is that high school work significantly reduced the predicted probability of later holding a service job for NLSY79 respondents but insignificantly increased it for the NLSY97 group. Senior-year work hours negatively predict the probability of graduating from college.[8] The beneficial effects of high school employment on subsequent labor market conditions would therefore presumably be even larger than those observed if not for these deleterious effects on educational attainment.

Table 9 returns to our main model, and examines predicted effects of senior year employment on adult (log) earnings, but with potential mediating factors now also controlled for separately or in combination. Our focus is on differences in the effects of student employment across the two cohorts. For example, model 1 shows our previously preferred specification (from model 5 in Table 4), with the aforementioned restriction that the covariates controlled for are common to both cohorts. Here, an extra 20 h per of senior year work increases estimated annual log wages by 0.155 for the NLSY79 sample versus 0.097 for the NLSY97 group, implying a difference of 0.058, as shown in the last row of the table. This implies that the predicted effect of 20 h of student work is a statistically significant 6.0 percentage points larger for the earlier than the later cohort.

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[7] Occupation of the adult job (e.g., blue collar and service sector versus white collar) is defined using Morefield, Ribar, and Ruhm's (2011) classification system. We explore whether economic conditions explain the decreasing returns to early work experience given prior evidence that graduating during an economic downturn negatively affects future wages (Kahn 2010; Oreopoulos, von Wachter, and Heisz 2012). The current unemployment rate is negatively correlated with earnings but the lowest unemployment rate since high school graduation has statistically insignificant effects. The returns to early work experience are not significantly affected by economic conditions as measured by these variables.

[8] We also attempted to estimate effects of high school employment on high school graduation. Senior-year work hours were not revealing because an extremely high proportion of seniors eventually graduate, regardless of work hours, while sophomore and junior year work hours had small and statistically insignificant effects.

Table 8. Regression-Adjusted Estimated Effects of Early Work Experience on Potential Mediating Factors

	(1) Blue-Collar	(2) Service	(3) Some College	(4) College Graduate	(5) Post-HS Work Experience	(6) Adult Tenure	(7) Same Job
				NLSY79 Respondents in 1987–1989			
Senior Hours	0.011	−0.018*	0.010	−0.065***	0.751***	0.316***	0.172***
	(0.014)	(0.011)	(0.014)	(0.013)	(0.051)	(0.051)	(0.015)
				NLSY97 Respondents in 2008–2010			
Senior Hours	0.021**	0.014	0.021	−0.074***	0.573***	0.243***	0.147***
	(0.010)	(0.011)	(0.013)	(0.012)	(0.044)	(0.044)	(0.013)

Table shows estimated coefficients on senior year weekly work hours divided by 20. Models include the demographic and supplemental family covariates common to both NLSY cohorts. Binary outcomes are estimated using linear probability models. Standard errors are in parentheses and are clustered at the sibling level. There are 3279 observations in the 1987–1989 NLSY79 sample and 3487 observations in the 2008–2010 NLSY97 sample.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

Column 2 shows that adding controls for adult employment in blue-collar or service occupations reduces the log earnings differential by more than 40% (from 0.058 to 0.034). This mainly occurs because senior year employment reduced the probability of ending up in a (relatively low paid) service job as an adult for the NLSY79 cohort, but increased it for the NSLY97 sample, thus offsetting a portion of the benefit of the early work that otherwise would have occurred for the later group.[9] Model 3 shows that although college attendance and graduation raise future earnings, neither these relationships nor the predicted effect of high school employment on subsequent educational attainment have changed much over time, so that including education in the model scarcely changes the estimated secular reduction in the student employment earnings premium.

By contrast, controlling for work experience reduces the log earnings differential by seventy percent, from 0.058 to 0.017 (see model 4). This reflects two factors. First, the predicted increase in subsequent work experience associated with senior year employment was 24% lower for the 1997 than 1979 cohort. Second, extra experience yielded a 20% lower earnings premium in the later period than the earlier one. Thus, the largest portion of the declining returns to senior year work operates through future labor market experience. Notice that the coefficients on senior year employment fell 60% or more when controlling for future experience, further confirming the important role of the latter. We also estimated a number of alternative experience specifications with generally comparable results. These included controlling for: (i) nonlinear effects with an additional squared experience covariate (the differential is 0.021), (ii) hours of post-high school employment (0.043), (iii) the proportion of post-high school weeks employed (0.013), (iv) weeks employed full-time (0.054), and (v) weeks employed full-time and weeks employed part-time (0.039).

We examined other dimensions of experience by including current job tenure and the probability of working at the same job held during high school. Neither factor was important, either in isolation or together. The difference in student employment effects on log earnings was 0.046 and 0.048 in models containing each separately, with standard errors of 0.028 and 0.029. Including all

[9] When controlling for 12 different occupation categories (as done by Morefield et al. 2011), the differential falls to 0.023. Conversely, using just two categories—blue-collar versus all other workers (Fletcher, Sindelar, and Yamaguchi 2011), or managers and professionals versus all others (Case and Deaton 2005)—the differentials were 0.050 and 0.038.

Table 9. Estimated Effects of Early Work Experience on Log Annual Earnings, With Mediating Factors

Model	(1)	(2)	(3)	(4)	(5)	(6)
	NLSY79 Respondents in 1987–1989					
Senior Hours	0.155***	0.144***	0.174***	0.056***	0.060***	0.067***
	(0.024)	(0.023)	(0.024)	(0.024)	(0.024)	(0.023)
Blue-Collar	-	−0.169***	-	-	-	−0.090***
	-	(0.033)	-	-	-	(0.032)
Service	-	−0.458***	-	-	-	−0.353***
	-	(0.045)	-	-	-	(0.042)
Some College	-	-	0.076**	-	-	0.063*
	-	-	(0.036)	-	-	(0.033)
College Grad	-	-	0.309***	-	-	0.343***
	-	-	(0.038)	-	-	(0.038)
Experience	-	-	-	0.131***	0.108***	0.119***
	-	-	-	(0.009)	(0.011)	(0.011)
Adult Tenure	-	-	-	-	0.065***	0.068***
	-	-	-	-	(0.010)	(0.009)
Same Job	-	-	-	-	−0.039	−0.052*
	-	-	-	-	(0.033)	(0.031)
	NLSY97 Respondents in 2008–2010					
Senior Hours	0.097***	0.110***	0.122***	0.039*	0.039*	0.071***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Blue-Collar	-	−0.080**	-	-	-	−0.004
	-	(0.040)	-	-	-	(0.040)
Service	-	−0.342***	-	-	-	−0.234***
	-	(0.037)	-	-	-	(0.036)
Some College	-	-	0.089**	-	-	0.085**
	-	-	(0.038)	-	-	(0.037)
College Grad	-	-	0.357***	-	-	0.335***
	-	-	(0.037)	-	-	(0.038)
Experience	-	-	-	0.102***	0.087***	0.077***
	-	-	-	(0.010)	(0.011)	(0.011)
Adult Tenure	-	-	-	-	0.071***	0.075***
	-	-	-	-	(0.010)	(0.010)
Same Job	-	-	-	-	−0.062**	−0.044
	-	-	-	-	(0.033)	(0.033)
Difference	0.058*	0.034	0.052	0.017	0.021	−0.004
	(0.032)	(0.031)	(0.032)	(0.032)	(0.032)	(0.032)

Table shows estimated coefficients on senior year weekly work hours divided by 20 and the potential mediating factors. White-collar occupations and a high school degree are the excluded categories. Models include the demographic and supplemental family covariates common to both NLSY cohorts. Dollar figures are adjusted for inflation to year-2012 dollars. Annual earnings are in logs and averaged over three survey years. Standard errors are in parentheses and are clustered at the sibling level. There are 3279 observations in the 1987–1989 NLSY79 sample and 3487 observations in the 2008–2010 NLSY97 sample.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

three experience-related variables together actually yields a slightly larger differential effect of senior year employment (of 0.021) than when work experience is controlled for alone (see model 5, where the differential is 0.017).

Model 6 simultaneously controls for all of the potential mediating factors. When this is done, the senior year employment coefficient is 0.067 for the 1979 cohort and is 0.071 for the 1997

Table 10. Estimated Effects of Early Work Experience on Log Annual Earnings, With Mediating Factors, by Education

Specification	(1)	(2)	(3)	(4)
	NLSY79 Respondents in 1987–1989			
	No College		Some College	
Senior Hours	0.202***	0.087***	0.104***	0.041
	(0.033)	(0.031)	(0.034)	(0.033)
Blue-Collar	-	−0.124***	-	−0.093*
	-	(0.043)	-	(0.048)
Service	-	−0.341***	-	−0.347***
	-	(0.057)	-	(0.067)
Post-High School Exp.	-	0.174***	-	0.059***
	-	(0.017)	-	(0.015)
Adult Tenure	-	0.030**	-	0.120***
	-	(0.012)	-	(0.015)
Same Job	-	−0.099**	-	−0.005
	-	(0.049)	-	(0.042)
Observations	1669	1660	1610	1610
	NLSY97 Respondents in 2008−2010			
	No College		Some College	
Senior Hours	0.076*	0.024	0.115***	0.089***
	(0.042)	(0.041)	(0.025)	(0.025)
Blue-Collar	-	0.133*	-	−0.120**
	-	(0.070)	-	(0.052)
Service	-	−0.190***	-	−0.225***
	-	(0.068)	-	(0.044)
Post-High School Exp.	-	0.089***	-	0.070***
	-	(0.022)	-	(0.013)
Adult Tenure	-	0.076***	-	0.073***
	-	(0.017)	-	(0.011)
Same Job	-	0.028	-	−0.065*
	-	(0.065)	-	(0.038)
Observations	1014	1024	2473	2473
Difference	0.126**	0.063	−0.011	−0.048
	(0.053)	(0.051)	(0.042)	(0.041)

Table shows estimated coefficients on senior year weekly work hours divided by 20 and the potential mediating factors. Standard errors are in parentheses and are clustered at the sibling level. White-collar occupations and a high school degree are the excluded category. Models include the demographic and supplemental family covariates common to both NLSY cohorts. Dollar figures are adjusted for inflation to year-2012 dollars. Annual earnings are in logs and averaged over three survey years.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

respondents, implying that the change over time in the effects of high school employment has been completely accounted for. As mentioned, is primarily due to subsequent experience and, to a lesser extent, to adult occupation.

Table 10 provides information on how the results differ for education subgroups, where "some college" includes those with any college experience, whether or not they receive a degree. For the NLSY79 cohort, the benefits of working in the senior year were strongly concentrated among those who did not attend college (model 1). Conversely, for the NLSY97 sample, the future earnings gains are actually somewhat larger for college attendees (model 3). Thus, the secular decline in the returns to early employment occurs only among the group without college. Adding

in the mediating factors reduces the expected returns in all cases, as shown in models 6 and 8, but does not change the pattern of particularly large declines for those never attending college.

7. Discussion

Work experience during the high school senior year predicts positive effects on labor market outcomes 5–11 years after the expected date of high school graduation, but these beneficial consequences appear to have attenuated over time. Our main regression specifications predict that the annual earnings premium from working 20 h per week in the senior grade has fallen from 17.4% for NLSY79 respondents in 1987–1989 to 12.1% for the NLSY97 sample in 2008–2010. Specifications that control for employment in other high school years indicate even larger secular reductions in the senior year employment effect. The benefits of student employment appear to be quite similar for men and women. Interestingly, the gains are concentrated among non-college-bound high school students in the earlier cohort but not the later one.

Two other findings deserve mention. First, even though summer work may be less likely than school year employment to take time from academic pursuits, we uncover no evidence that it has more beneficial effects on future labor market outcomes. Second, while senior-year work experience significantly enhances adult labor market outcomes, sophomore and junior work hours typically do not. Differences in the effects of early work experience between the senior year and the sophomore and junior years could be due to Fair Labor Standards Act restrictions on the labor supply of youths (teens under 16 are prohibited from working in non-farm jobs more than three hours on school days and 18 hours weekly) or to those placed on younger teens by their parents. Alternatively, the freelance jobs are more common for this age group and may have less beneficial effects than employee jobs.

These findings should be interpreted in light of at least four caveats. First, almost all of our analysis is restricted to high school graduates. To the extent that employment during the sophomore and junior years reduces the probability of completing high school, we might be neglecting a negative effect of student employment. However, the estimated effects of sophomore- and junior-year work on high school graduation are small. Second, the failure to account for nonrandom selection into high school employment could introduce bias. We are somewhat reassured that this will not be a major issue since the estimated effects of working in the senior year change little when additional covariates are included in the model. Third, the differential changes over time in the effects obtained across educational categories do not account for the secular increase in educational attainment occurring over the analysis period, which suggests that the "no college group" is likely to be more negatively selected for the NLSY97 than NLSY79 cohort.

A fourth concern is that some of the differences observed across the two cohorts could occur because much of the 2008–2010 period examined for the NLSY97 sample coincides with the Great Recession, which ran from December of 2007 through June of 2009 (and with considerable weakness in the labor market continuing for several years thereafter).[10] To provide some evidence on whether this was important, we re-estimated our models using outcomes for slightly earlier time periods—1985–1986 for the NLSY79 sample and 2006–2007 for NLSY97 respondents. The

[10] For instance, civilian annual unemployment rates averaged 5.8, 9.35, and 9.6% in 2008, 2009, and 2010, as compared to 6.2, 5.5, and 5.3% for the 1987–1989 period used for the NLSY79 cohort (Council of Economic Advisers 2016).

estimated returns to senior year employment were even larger for both cohorts, but the returns again fell by around one-third over time.[11] Given this, it seems unlikely that the Great Recession plays a major role in explaining the patterns highlighted here.

Our analysis points to changes in the effects of early employment on subsequent work experience and, to a lesser extent, adult occupation as playing them most important roles in explaining why the benefits of early work experience have attenuated over time. Specifically, employment during the senior high school year is associated with a smaller increase in future experience than used to be and the return to that experience, in the form of higher annual earnings, has also diminished over time. Similarly, senior year employment reduced the likelihood that a member of the NLSY79 sample later ended up in a (typically low paid) service occupation, while this probability was (insignificantly) increased for the NLSY97 cohort. This more than offset the slightly smaller earnings penalty associated with service employment in recent years.

Appendix: Descriptive Statistics: Demographic Characteristics

	NLSY79 (1987–1989)	NLSY97 (2008–2010)
Demographic Characteristics		
Male (=1 if male)	0.495 (0.008)	0.500 (0.007)
Black (=1 if black)	0.140 (0.005)	0.142 (0.005)
Hispanic (=1 if Hispanic)	0.050 (0.003)	0.119 (0.005)
Age (in years)	26.336 (0.021)	27.098 (0.018)
Marital Status (=1 if married)	0.508 (0.008)	0.340 (0.007)
Family Size (members)	2.622 (0.023)	2.912 (0.023)
Cigarettes (cigarettes smoked per day)	4.499 (0.143)	2.100 (0.086)
Body Mass Index (weight divided by squared height)	22.286 (0.056)	24.509 (0.083)
Northeast (=1 if northeast residence)	0.198 (0.006)	0.165 (0.005)
South (=1 if south residence)	0.338 (0.007)	0.359 (0.006)
West (=1 if west residence)	0.173 (0.006)	0.231 (0.007)
Urbanicity (=1 if urban residence)	0.802 (0.006)	0.769 (0.006)
Current County Unemployment Rate (percent)	5.376 (0.032)	8.988 (0.036)
Lowest County Unemployment Rate (percent)	5.099 (0.028)	3.321 (0.017)
Sample Size	3637	3925

Weighted means are provided with standard errors are in parentheses. Adult economic outcomes are averaged over the indicated three-survey year period.

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[11] In specifications corresponding to model 5 of Table 4, but for the earlier years, the coefficients (standard errors) on senior year work hours were 0.247 (0.027) and 0.165 (0.023) for the NLSY79 and NLSY97 samples. In specifications corresponding to models 1 and 6 of Table 9, the estimated difference in returns to early work falls from 0.089 (0.035) without mediating factors to 0.002 (0.032) when the full set are included.

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