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If Johnny can't work, can Johnny read better?:
Child Labor Laws, Labor Supply and Schooling Outcomes

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In the United States, both federal and state governments have tried to establish and enforce child labor laws to protect youth from work that interferes with their schooling. While federal child labor law focuses on the work experience of minors, especially those aged 15 and below; state child labor laws often restrict the work activities of 16- and 17-year olds. The two most common state child labor restrictions are work permit requirements for teenagers and school dropout ages that are more stringent than federal requirements. If these laws are effectively targeted and enforced, children living in states legislating more stringent child labor laws should be less likely to work, should work fewer hours if they do work, and they should have better average schooling outcomes. The results show that stricter state laws do not lower significantly the likelihood that a 14-15 year old youths work or the likelihood their hours exceed federal guidelines. Child labor laws do have small positive effects on academic outcomes. State work permit requirements modestly increase the likelihood of college entry while more stringent truancy laws increase marginally high school academic performance.

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I. Introduction

Nearly one-fifth of 14 year-olds, the youngest legal working age, works at least one week at any point during a school year. The likelihood of working rises steadily with age: 29% of 15-year-olds; 60% of 16-year-olds; 71% of 17-year-olds.¹ These high youth employment rates raise concerns about the desirability of working while attending high school.

Parents believe that child labor can foster self-reliance and money management skills, smooth the transition from school to work, and allow the child to save money for college. However, employment during high school could lead to less time being spent on academic or extracurricular activities that presumably improve learning while in school. Under current competing views, some policy makers advocated programs to improve school - work connections for youth² while others have advocated restriction on child labor.³

In the United States, both federal and state governments have tried to establish and enforce child labor laws to protect youth from work that may be dangerous and that may interfere with their schooling. Since 1938, the Fair Labor Standards Act (FLSA) has regulated child labor at the Federal level. It limits the number of hours and the type of work for 14- and 15-year olds. In addition, many state laws mandate standards that go beyond the Federal law. The most common of these set maximum hours and/or night work restrictions for 16- and 17-year olds or set more stringent restrictions on school-leaving age.

¹ Similar patterns are shown in Rothstein (2001) and in USDL 03-40, a news release from the U.S. Bureau of Labor Statistics (2003). There are two job types related to early work experience. "Employee" jobs involve an ongoing relationship with a particular employer such as working in a grocery market. "Freelance" jobs have no specific boss such as informal babysitting. We only have information on employee jobs.

² For example, the *1994 School-to-Work Opportunities Act* includes incentives for states to strengthen the linkage between school and work.

³ For example, in 1998, a National Research Council panel recommended that limitations be placed on the number of hours of work for 16- and 17-years olds while in school.

There is mixed evidence on the impact of these laws. Lleras-Muney (2002) examined how state compulsory attendance and child labor laws contributed to the increase in educational attainment of U.S. residents in the first half of the twentieth century. Laws requiring children to attend 1 more year of school or increasing the minimum working age by one year increased average years of schooling by 5 percent from 1915 to 1939. In contrast, Moehling (1999) found that child labor regulations had little apparent effect on child labor between 1880 and 1910.

The differences in their findings emphasize that these laws may only make a difference if they are enforced. Moskowitz (2000) argues that weak enforcement and penalties mean that federal laws do not adequately protect children against occupational hazards. Kruse and Mahony (2000) provide comprehensive estimates of the extent of illegal child labor in the United States using Current Population Survey (CPS) and other sources.⁴ They estimate that 154,000 children under 18 or roughly 0.7% of the population of children were engaged in working in violation of state or federal child laws in an average week.⁵ Because teenagers move in and out of the labor force frequently, the fraction of teens working illegally during a year is much larger.

The Moskowitz and Kruse and Mahoney studies leave unanswered whether there are adverse consequences for children engaged in illegal child labor. This study extends their work by examining how state child labor laws affect child work time allocation and school outcomes. Because states vary in the strictness of state labor and truancy regulations, we can

⁴ They combined 33 monthly CPS surveys from January 1995 to September 1997 in order to estimate illegal employment of teens aged 15 and older. Their information on 14-years old and younger workers was taken from the NLSY79, the NLSY97 and the NLS-Adolescent Health data.

⁵ They determined illegal working by matching occupation codes of youth into the federal or state restrictions on type of work. Also, hours restriction of FLSA is applied to estimate of illegal working of 14-and 15-year-olds.

determine if stricter laws are effective in limiting teen work and whether they improve schooling outcomes.

This study examines how state child labor legislation affects the employment and school decisions of youth aged 14 through 17. Our findings suggest that stricter state child labor laws do not lower the likelihood that a child works, nor do they lower the likelihood of working in excess of federal hours limits. Furthermore, children who work excessive hours relative to the legal limits do not suffer inferior schooling outcomes. Stricter state laws requiring work permits or raising the truancy age do have small positive effects on schooling outcomes.

The next section summarizes the existing federal and state child labor laws. Section III specifies an empirical strategy for measuring how state laws affect labor supply and schooling choices. Section IV presents the data and section V reviews our results. In section VI, we discuss the implications of this study for policy and further research.

II. Child Labor Laws

States can have stricter child labor laws than the federal law, but the federal child labor laws hold in the absence of stricter state laws. In the United States, FLSA gives the Department of Labor authority to prohibit minors under age 18 from working in occupations deemed too hazardous. The FLSA also limits the number of hours and times of day that 14- and 15-year olds can work. At those ages, children are limited to work a maximum of three hours per day and eight hours per week during weeks that school is in session, and no more than forty hours per week during school vacations. Children under the age of 14 are prohibited from working except for agricultural employment, working for a family business, or performing “freelance work” such as babysitting or delivering newspapers. Child labor in

agriculture is much less regulated. Regardless of age, children may be employed in any non-hazardous farm job without any restriction on number of hours during the school year.

Children younger than age 14 may work only on their parents' farm or on another farm with the written consent of their parents. Children who are 14 or older may work on farms without parental consent. By age 16, youths are no longer subject to protective restrictions on agricultural jobs which are regarded as hazardous.

While the FLSA concentrates on the labor of youth under 16 years of age, some states have extended restrictions to older youth. Sixteen states have child labor laws restricting the working hours of 16 and 17 year-old youth through a work permit requirement. An additional 22 states require work permits for 14 and 15 year olds that are more restrictive than the federal requirements. State compulsory school attendance laws limit work indirectly by requiring time in school. Twenty two states have truancy ages above 16, the federal truancy age.⁶

The stated goal of the FLSA and state child labor law is to protect youth from long work hours or dangerous working conditions. Presumably, the hours restrictions are intended to guide youth on levels of work intensity that will not retard educational development but will allow work experience that may ease entry into the full-time labor market after leaving high school. If these laws are effective, they should have a positive impact on the probability of completing high school or attending college and should improve academic performance in high school. The next section proposes an empirical strategy for assessing whether those expectations are consistent with the data on child academic progress across states.

III. Model Specification

⁶ Compulsory attendance laws by state is available on NCSE(2003).

We assume that parents decide or at least approve their child's intensity of employment. Let $w_{ij} \in \{0, 1, 2, 3\}$ be an ordered indicator variable representing progressively higher values of hours of work for a child i in state j . It is convenient to relate the observed data to our policy application, and so we set the thresholds to correspond to the legal federal limits on child working hours. For a child who does not work at all during school year, $w_{ij} = 0$. For a child who works within FLSA hours guidelines, $w_{ij} = 1$. $w_{ij} = 2$ indicates a modest degree of FLSA violations, taken to be one to five weekly violations during the school year. $w_{ij} = 3$ indicates frequent violations, defined as more than five weekly violations in the school year. The threshold of five weekly violations which distinguishes between 'modest' and 'frequent' violators was selected to divide the violators into two groups of roughly equal size.

There are two issues that require comment regarding our use of these ordered work states. First, we use federal hours limits as the reference for w_{ij} despite the fact that we are evaluating state child labor laws. Had we used the state limits as the reference, states with more restrictive laws would have violations that would not be counted as a violation in more lax states. The federal guidelines provide a common reference across all states. Second, we could have used child work hours directly rather than these four groupings. Our use of the groups helps to highlight the threshold nature of working within versus working outside the FLSA guidelines. In addition, the groupings may help to sidestep some measurement problems associated with recollections of working hours during the year. We expect that youth may be able to recall occasional from frequent weekly hours violations, but not

necessarily the actual number of occurrences of those violations. Therefore the ordered groupings may be better measures of the incidence of illegal work.

Letting W_{ij}^* be a latent variable indexing progressively greater work intensity, we assume

$$W_{ij}^* = Z_{ij}\beta^W + D_{ij}\gamma^W + \varepsilon_{ij}, \quad (1)$$

where D_{ij} is a dummy variable indicating whether the state has more restrictive child labor laws than the federal level; Z_{ij} is a vector of individual and household demographic and socioeconomic characteristics; and ε_{ij} is a random error for child i in state j . As W_{ij}^* increases, the probability a child is found in a particular work intensity state is given by

$$\begin{aligned} W_{ij} &= 0 && \text{if } W_{ij}^* \leq 0 \\ W_{ij} &= 1 && \text{if } 0 < W_{ij}^* \leq \mu_1 \\ W_{ij} &= 2 && \text{if } \mu_1 < W_{ij}^* \leq \mu_2 \\ W_{ij} &= 3 && \text{if } \mu_2 < W_{ij}^* \end{aligned} \quad (2)$$

If the errors are distributed standard normal, equations (1) and (2) describe an ordered probit specification. The regression parameters β^W, γ^W and the two cut points can be estimated using maximum likelihood methods.

In typical cases, if restrictive state child labor laws are effective in regulating work intensity, then $\gamma^W < 0$. In our ordered specification, it is possible that the laws may shift children into legal work from illegal work, but also from not working to working. In that

case, the opposite sign might obtain. To avoid incorrect inferences, we will need to evaluate the probability of each outcome W_{ij} as the laws change.⁷

We are also interested in determining how child labor laws affect school outcomes.

We will employ regressions of the form

$$S_{ij} = \delta_0 + Z_{ij} \beta_D^E + D_{ij} \gamma_S^D + \nu_{ij}, \quad (3)$$

where S_{ij} is a schooling outcome measure; ν_{ij} is the error term; and the other variables are as defined above. If restrictions on child labor are useful, they should positively affect measurable academic outcomes so that $\gamma_S^D > 0$.

If the restrictions on child labor are set appropriately, we should find stronger effects of illegal than legal labor and there should be no adverse impact of legal labor on school outcomes. To investigate these hypotheses, we can insert measures of hours worked within and beyond the federal guidelines as measures of the degree of violation of child labor limits. These hypotheses can be tested directly by replacing D_{ij} by W_{ij} in (3) so that

$$S_{ij} = \delta_0 + Z_{ij} \beta_W^E + W_{ij} \gamma_S^W + \nu_{ij}, \quad (4)$$

Youth working beyond federal guidelines should suffer adverse schooling outcomes so that $\gamma_S^W < 0$.

Are state child labor laws exogenous?

⁷ Using the standard normal distribution for ε_{ij} and using $X\beta$ as shorthand notation for $(Z_{ij} \beta^W + D_{ij} \gamma^W)$, $\Pr(W_{ij} = 0) = \Pr(W_{ij}^* \leq 0) = \Pr(X\beta + \varepsilon_{ij} \leq 0) = \Phi(X\beta)$, $\Pr(W_{ij} = 1) = \Pr(0 < W_{ij}^* \leq \mu_1) = \Pr(0 < (X\beta + \varepsilon_{ij}) \leq \mu_1) = \Phi(\mu_1 - X\beta) - \Phi(-X\beta)$, ... , and $\Pr(W_{ij} = 2) = \Pr(X\beta + \varepsilon_{ij} \geq \mu_2) = 1 - \Phi(\mu_2 - X\beta)$ where Φ is the standard normal cumulative distribution function. Each of these probabilities can be evaluated at $D_{ij} = 1$ and $D_{ij} = 0$, holding all other exogenous variables constant (See Greene(1997), Cameron & Trivedi(2005) and Wooldridge(2002)).

The specifications above presume that state child labor and truancy laws are exogenous. This would not be true if households move across state boundaries because of the child labor or truancy laws, or if those laws are altered in response to prevailing and pervasive tastes for child labor or schooling outcomes in the state. It seems unlikely that parents migrate across states because of state laws restricting child labor, but it is more plausible that child labor laws are set in response to preexisting attitudes toward child labor in the state. We explore the issue using probit regressions of dichotomous variables indicating the existence of various restrictive state child labor laws. States are defined as having more stringent child labor laws if they require a work permit for 16- or 17-year olds or if they specified a legal dropout age above age 16. Regressors include state per capita income, state unionization rates and a dummy variable indicating whether the state has a higher minimum wage than the federal minimum wage rate. We would expect that if protective child labor laws are endogenous, they would be positively correlated with these measures of support for pro-labor policies or state income levels.

Note that this specification does not presume a causal relationship between the regressors and the dependent variable—it is merely a convenient mechanism to assess underlying correlations in the data. For example, a high correlation between state minimum wage and child labor legislation would suggest a greater likelihood that an underlying taste for protective labor legislation exists in the state.

Results are reported in Table 1. The first column reports the probit estimates explaining the existence of state work permit requirements and the second column reports the estimates explaining the existence of state compulsory schooling attendance laws. The estimates show that states with child labor legislation that exceed the federal minimums are

not disproportionately wealthy, unionized, or prone to passing other protective legislation.⁸ While this is not a definitive test, it does not appear that state child labor laws are highly correlated with other state restrictive legislation or preexisting tastes that would bias our coefficient estimates.

IV. Data

A. NLSY97

The National Longitudinal Survey of Youth 1997 (NLSY97) provides data on the transition from school to work for a representative sample of U.S. youths born in 1980 through 1984. The NLSY97 sample covers 43 states and provides a wealth of useful information on household factors that may be correlated with labor market behavior and educational experiences. It also tracks the working hours of youths on a weekly basis from age 14 onward. The tracking data also include information on whether and when respondents obtained a high school diploma, how well they performed in school, and whether they went to college. By May 31, 2002, roughly two-thirds of the NLSY97 sample was old enough to have graduated from high school, and roughly 77% of those had actually graduated.

We are interested in assessing how measures of child labor intensity and school performance are related to state child labor and truancy laws, holding constant Z_{ij} that should affect schooling and employment decisions. The vector Z_{ij} includes measures of child ability, gender and race, and the socioeconomic and demographic attributes of the parents. Child ability is measured by 8th grade GPA. Poor academic preparation for high school may lower the returns to schooling and increase the likelihood of working at a young age.

⁸ The results are similar when ordered measures reflecting increasing rigor of child labor laws are used in place of the dichotomous dependent variables. For example, we also find no significant predictors of the existence of work permit requirements measured with higher values for requirements at ages 16, 17 and 18.

Previous studies have shown that a child's performance in school is strongly influenced by the child's parents. We control for the presence of two biological parents in the household and households with at least one missing parent. We also control for the education of the father and mother and for aggregate household income, all of which would be expected to raise household demand for schooling. The impact of these variables on child labor is less certain in the literature. Finally, we include a dummy variable for rural residence, as there may be more demand for child labor in rural areas, particularly with regard to agricultural work.

B. Descriptive analysis

B.1. Employment experience of high school-aged youth

Table 2 reports the employment rate and average working hours during the school year for youth who eventually completed high school. Averages are further broken down by demographic and community characteristics. Academic year labor supply rises with age. Nineteen percent of children work in their 14th year at an average of 6.4 hours per week. Labor force participation dramatically increases to 61% by age 16, with average weekly hours worked rising to 11.6. There is a significant difference between boys' and girls' labor-force participation rates and cumulative working hours. At earlier ages, boys are more likely to work, but the gap disappears by age 17. At all ages, however, boys work more hours. White children have higher labor force participation rates and work more hours than either Black or Hispanic youth. Those with the highest 8th grade GPAs are the most likely to work, but they work fewer hours per week.

Child labor force participation differs significantly by parental attributes. Children with two-biological parents in the household are more likely to work. Children worked least

if their parents did not complete high school. They worked most if their parents had some college training. However, children with more educated parents tend to work more modest hours. Students in households with lower income might be expected to work more in order to pay for additional schooling or to finance current consumption. However, youth in the lowest income households are the least likely to work. Youth in wealthier households participate most in the labor market, but they work fewer hours than average. Rural youth are modestly more likely to work than their urban counterparts. The rural-urban gap in average cumulative hours shrinks with age.

B.2 Illegal youth employment

To assess the effectiveness of child labor regulations, we need to know how many youth are working illegally. We define a work week as illegal if a child worked an excessive number of hours using the FLSA standards as a gauge. The most common violation is working beyond the legal maximum. By federal standards, 14- and 15-year-olds are regarded as working illegally if they worked over 40 hours per week during the summer or more than 18 hours per week when school is in session. Following the classification used in the model, Table 3 shows the distribution of employment states for youth aged 14 and 15 between 1994 and 1999. Work states $w_{ij} = 2,3$ indicate working in violation of FLSA maximum hours limits. For high school graduates, 3% of 14-year-olds worked illegally between 1 and 5 weeks during the school year or 17% of working 14-year olds. A similar proportion violated the law more than 5 weeks of the school year. By age 15, the proportion of regularly violating the hours' restrictions during the school year rises to 9% or nearly one-third of working 15-year-olds. Dropouts violated FLSA guidelines at the almost same rate. However, conditional on working, dropouts were more likely to work in violation of FLSA hours limits. Violations

were less common in summer months than during the school year, reflecting the much higher hours limits during school vacations.⁹

Table 4 presents additional information on the incidence of legal and illegal work for 14-15 year old children by whether they ultimately dropped out of or graduated from high school. Labor supply measures are for any week during the two-year period, and so a higher fraction is observed working than in Table 3 which presents statistics for a single year.

Children who eventually dropped out of school were significantly less likely to work than those who eventually graduated from high school. However, graduates worked more commonly within federal hours guidelines. White and Hispanic dropouts are more likely to violate FLSA hours limits, but for the most part, the demographic distribution of illegal workers is similar between dropouts and graduates.

V. Empirical Results

A. Are state child labor laws effective in limiting child labor?

In Table 5, we examine whether variation in the rigor of the state child labor laws affects federal labor law violations for youth aged 14 and 15. The first three columns show that neither state work permit requirements nor state truancy laws significantly affect the intensity of work for 14-year-olds. The same conclusions hold for 15-year-olds. It does not appear that state child labor regulations affect whether a child works, how much a child works, or whether the child works in violation of federal guidelines. Of the other factors,

⁹ The percent of youth who violated FLSA standards in this study is greater than reported by Kruse and Mahony (2000) based on the Current Population Survey (CPS). This is to be expected because the NLSY97 reports employment over 52 weeks rather than only in the last week as in the CPS. Also, the CPS relies on a primary respondent other than the youth him or herself to collect data on youth employment. The NLSY97 survey is always answered by the youth. Parents may not always be aware of the children's working hours, especially if the employment is sporadic or occasionally involves excessive hours.

youth are more likely to work in violation of federal guidelines if they are white, male, rural, and from wealthier households.

To obtain a clearer idea of the impact of state child labor laws on probability of each work intensity state, we evaluate the probabilities of each outcome at sample means.¹⁰ We estimate the probabilities alternating D^W (or D^S) = 1 and D^W (or D^S) = 0, all other variables held at their sample averages. For example, when $D^W = 0$, the predicted probabilities of the four labor supply states are $\Pr(W_{ij} = 0) = 0.82$, $\Pr(W_{ij} = 1) = 0.12$, $\Pr(W_{ij} = 2) = 0.03$ and $\Pr(W_{ij} = 3) = 0.03$. The corresponding probabilities when $D^W = 1$ are 0.82, 0.12, 0.03 and 0.03. We can perform statistical tests on the differences between these predicted probabilities, as summarized in Table 6. More stringent work permit requirements reduce the incidence of legal and illegal work by less than one percentage point. The same lack of substantial change in labor supply choices can be seen contrasting the presence and the absence of state compulsory attendance laws. Controlling for other demographic factors, the predicted probability of working in violation of the FLSA is decreased by less than 1% when a state imposes more stringent compulsory attendance laws.

It is possible that the combination of constraints on child labor may matter, even when no individual policy appears to affect choices. However, even when both policies are in effect compared to neither policy being enacted, the combined policies lower the likelihood of working by only 2 percentage points and decrease the likelihood of frequent federal hours violations by less than one percentage point. Nearly identical results are found for 15 year olds. On the whole, state work permit requirements and compulsory school attendance laws change child labor patterns only marginally. It is difficult to believe that

¹⁰ Our derivations are based on Greene (1997).

these modest effects alter the time available for schooling by an economically important amount.

B. Are state child labor laws effective in raising schooling attainment?

Child labor laws may affect schooling outcomes, even if they have negligible effects on child labor supply. Table 7 reports estimates of equation (3). Our measures of schooling outcomes include high school grade point average and completion and the choice to attend college. Requiring a work permit under age 18 does not seem to affect the probability of completing high school, nor does it affect high school GPA. It does raise the probability of attending college by 3 percentage points, but the estimate is only marginally significant. Compulsory attendance laws that require youth to stay in school through ages 17 or 18 have a small impact on achievement, raising high school GPA by 0.06 or 2%. More stringent attendance laws have no discernable effect on the probability of attending college. When we combine the effects of the two state laws, the only significant effect is a small improvement in high school GPA.

The control variables Z_{ij} have plausible effects on schooling outcomes. Students are more likely to complete high school, attend college, and get good grades if they are female, have a high 8th grade GPA, high household income, well-educated parents, and both parents present in the home.

C. Are federal hours guidelines effective in raising schooling attainment?

It appears that state laws are only marginally effective in raising schooling outcomes. This begs the question of whether hours guidelines are set effectively so as to ensure that schooling does not suffer. To examine this question, we estimate equation (4) to assess whether there are negative schooling consequences from working in excess of proscribed

hours limits. Dummy variables indicate three employment status measures, ($W_{ij} = 1, 2, 3$) with non-workers ($W_{ij} = 0$) as the reference group. The results are given in Table 8.

Compared to children not working, we find that children working within FLSA limits have a greater likelihood of completing high school. However, those frequently working in violation of FLSA are no less likely to complete high school than are children who never work during the school year. There is no discernible effect of child labor patterns on high school GPA or the probability of going to college. Overall, there is no strong consistent evidence that children working hours in excess of the federal legal limits have inferior schooling outcomes relative to children who do not work at all. This suggests that the federal guidelines are not well targeted to limit types of child labor that hinder academic outcomes.

VI. Conclusions

If restrictions on child labor are useful, they should be tied to measurable employment status or academic outcomes. Our study shows that more stringent state child labor laws requiring work permit requirement under age 18 and mandating that children stay in school through ages 17 or 18 have almost no impact on labor market entry decisions or the frequency of working hours in violation of federal labor law. In addition, youth whose work hours exceed federal guidelines do not have inferior schooling outcomes to teens who do not work at all. These findings suggest that state labor laws do not have strong effects on youth labor supply choices and that hours restrictions are not well supported by evidence on adverse impacts of work hours on schooling.

State truancy and work permit regulations do have small positive effects on high school academic performance, the likelihood of completing high school, and the likelihood of

entering college. However, in all cases the effects are smaller than 3% and are frequently imprecisely estimated. Past studies have shown that these laws have had more substantial effects on schooling decisions historically.

Variations in state employment and truancy laws have played a prominent role in studies of returns to schooling. Historically, changes in federal and state labor laws have been found to have important effects on youth schooling and labor supply decisions. Consequently, these laws have proven useful as exogenous factors shifting years of schooling to correct for endogeneity in years of schooling completed.¹¹ Our findings suggest that these laws are much weaker instruments for current educational and labor supply decisions than they may have been historically.

¹¹ Angrist and Krueger (1991), Tyler (2003) and Rothstein (2007) are examples of papers that used state variation in child labor laws to help identify time allocated to school or work.

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Table 1. Probit estimates of the effect of state characteristics on the rigor of state child labor laws

State characteristics	State child labor laws	
	Work permit requirement under age 18 ($D^w = 1$)	Compulsory schooling attendance above age 16 ($D^s = 1$)
Log (state per capita income)	2.315 (1.726)	-2.229 (1.572)
State union density	.029 (.037)	.002 (.036)
State minimum wage above FLSA standard	-.108 (.535)	.622 (.510)
Constant	-24.369 (17.231)	22.163 (15.652)
Log-likelihood	-28.317	-33.105
N	51	51
Pseudo R2	.083	.042

Note. Standard errors are in parenthesis.

Table 2. Percent of high school graduates employed during the school year and average weekly hours worked if employed by age and demographic characteristics, 1994-2001 (N=3384)

Characteristics	Age14	Age15	Age16	Age17	Age14-17
Total	18.9 (6.4)	29.3 (8.2)	60.5 (11.6)	73.3 (16.0)	81.7 (6.8)
<i>Gender</i>					
Female	14.3 (5.7)	26.3 (7.4)	59.3 (11.3)	73.5 (15.8)	80.6 (5.9)
Male	24.1 (7.0)	32.6 (8.9)	61.8 (11.9)	73.0 (16.3)	82.9 (7.2)
<i>Race or Ethnicity</i>					
Black	11.1 (5.5)	19.6 (7.6)	50.6 (12.2)	64.7 (15.3)	73.8 (6.2)
Hispanic	14.7 (5.0)	20.2 (7.3)	48.7 (11.2)	64.8 (15.4)	73.1 (6.0)
White	23.4 (6.9)	36.0 (8.4)	68.2 (11.6)	79.4 (16.4)	87.5 (7.3)
<i>8th Grade GPA</i>					
Less than 2.50	18.3 (5.9)	27.8 (7.6)	59.5 (11.8)	72.3 (16.1)	81.4 (6.7)
2.51 – 3.50	18.2 (6.5)	29.0 (8.2)	60.2 (11.9)	73.9 (16.6)	81.6 (7.0)
3.51 – 4.00	20.9 (6.9)	31.4 (8.7)	62.2 (10.7)	73.3 (15.0)	82.1 (6.7)
<i>Family Structure</i>					
Two-biological parents	21.5 (6.3)	30.9 (8.2)	61.7 (11.3)	73.7 (15.6)	82.5 (6.8)
Not Two-biological parents	14.9 (6.7)	26.8 (8.2)	58.6 (12.1)	72.7 (16.7)	80.5 (6.9)

Note. The top number is the percent working at least one week. The number in parentheses is the average hours worked per week, computed by dividing cumulative hours of work during the school year by the number of weeks in the school term.

Table 2. (Continued)

Characteristics	Age14	Age15	Age16	Age17	Age14-17
<i>Father's education</i>					
HS dropout	16.5 (5.7)	22.0 (8.3)	52.5 (13.3)	69.5 (16.2)	75.8 (6.9)
HS graduate	21.5 (7.4)	31.5 (8.6)	63.9 (12.2)	76.6 (17.3)	84.1 (7.5)
Some College	22.1 (6.9)	34.0 (8.8)	67.3 (11.9)	78.3 (16.9)	86.8 (7.4)
College and higher	20.8 (5.5)	32.0 (7.0)	63.0 (9.7)	73.5 (13.9)	82.9 (5.9)
<i>Mother's education</i>					
HS dropout	13.1 (6.8)	20.4 (8.6)	48.3 (12.0)	63.0 (16.0)	71.7 (6.5)
HS graduate	20.6 (6.8)	31.3 (8.8)	63.0 (12.4)	76.7 (17.4)	83.7 (7.6)
Some College	18.9 (5.9)	32.0 (8.4)	64.5 (11.5)	79.7 (15.7)	86.2 (6.9)
College and higher	20.8 (5.8)	29.5 (6.8)	60.7 (10.1)	70.7 (13.8)	81.5 (5.9)
<i>Household Income</i>					
Less than \$ 25,000	14.5 (5.8)	22.2 (8.1)	51.1 (11.2)	64.7 (15.1)	73.4 (6.2)
\$25,000 - \$44,999	18.9 (7.2)	28.2 (8.2)	58.0 (12.2)	73.0 (17.0)	81.9 (7.1)
\$45,000 - \$74,999	19.2 (6.7)	31.0 (8.6)	66.1 (11.9)	76.7 (16.8)	84.1 (7.4)
\$75,000 or more	22.5 (6.0)	34.7 (7.8)	65.2 (11.1)	77.2 (15.1)	86.0 (6.7)
<i>Residence Area</i>					
Rural	22.4 (7.6)	31.4 (9.2)	61.1 (12.2)	73.8 (16.3)	81.9 (7.3)
Urban	17.4 (5.9)	28.4 (7.7)	60.2 (11.4)	73.1 (15.9)	81.6 (6.6)

Note. The top number is the percent working at least one week. The number in parentheses is the average hours worked per week, computed by dividing cumulative hours of work during the school year by the number of weeks in the school term.

Table 3. Employment status of youth aged 14 or 15, 1994-1999 by eventual high school completion

	$W_{ij} = 0$: Not Working		$W_{ij} = 1$: Working within FLSA hours limits		$W_{ij} = 2$: Occasionally violating FLSA hours limits		$W_{ij} = 3$: Frequently violating FLSA hours limits	
	Dropouts	HS graduates	Dropouts	HS graduates	Dropouts	HS graduates	Dropouts	HS graduates
<i>(All children)</i>								
<i>School months</i>								
At age 14	85.3	81.1	7.6	12.5	4.1	3.3	3.3	3.2
At age 15	76.4	70.7	9.2	15.8	4.8	4.8	9.7	8.7
<i>Summer months</i>								
At age 14	84.1	80.4	14.3	18.6	1.0	0.4	0.7	0.6
At age 15	77.7	68.8	20.6	29.1	0.2	0.8	1.6	1.4
<i>(Working children)</i>								
<i>School months</i>								
At age 14	NA	NA	50.6	66.0	27.5	17.2	22.0	16.7
At age 15	NA	NA	38.9	54.0	20.1	16.4	41.0	29.6
<i>Summer months</i>								
At age 14	NA	NA	89.7	95.0	6.2	2.0	4.1	3.0
At age 15	NA	NA	91.9	93.1	0.7	2.6	7.4	4.4

Note: There are 608 dropouts and 3384 high school graduates in the sample

Table 4. Cumulative employment status during the school year of youth during ages 14-15 by high school completion and demographic characteristics, 1994-1999

	$W_{ij} = 0 :$			$W_{ij} = 1 :$			$W_{ij} = 2 \text{ or } 3 :$		
	Not working			Working within FLSA hours limits			Violating FLSA hours limits		
	Dropouts	HS Graduates	dif	Dropouts	HS Graduates	dif	Dropouts	HS Graduates	dif.
Total	71.6	66.6	*	11.3	17.7	**	17.1	15.7	
<i>Gender</i>									
Female	74.9	70.5	**	9.2	15.7	***	15.9	13.8	
Male	69.0	62.2		13.0	19.9	***	18.0	17.9	
<i>Race or Ethnicity</i>									
Black	80.7	76.2		9.9	9.7		9.4	14.2	*
Hispanic	78.8	74.5		6.4	12.8	***	14.8	12.8	***
White	60.9	59.6	**	15.8	22.9		23.3	17.4	**
<i>8th Grade GPA</i>									
Less than 2.50	74.8	68.0	***	11.4	17.3	***	13.8	14.7	
2.51 – 3.50	60.8	66.8	*	12.4	16.7		26.9	16.5	***
3.51 – 4.00	90.5	64.4	**	4.8	19.9	*	4.8	15.7	
<i>Family Structure</i>									
Two-biological parents	66.4	65.1		14.3	19.8	**	19.3	15.1	*
Not two-biological parents	74.3	69.1	**	9.8	14.4	***	15.9	16.6	
<i>Father's Education</i>									
HS dropout	72.7	72.8		11.5	12.3		15.8	15.0	
HS graduate	68.4	63.2		12.0	18.6	*	19.7	18.2	
Some College	57.9	61.3		15.8	22.4		26.3	16.4	*
College and higher	60.0	64.5		15.0	22.3		25.0	13.2	
<i>Mother's Education</i>									
HS dropout	76.6	76.4		6.3	10.2	*	17.1	13.5	
HS graduate	69.8	63.0	**	13.2	18.2	*	17.0	18.8	
Some College	67.0	64.5		19.4	20.4		13.6	15.1	
College and higher	61.1	65.7		16.7	20.3		22.2	14.1	

Note. There are 608 dropouts and 3384 high school graduates in the sample . dif represents the test of difference in means between high school dropout and high school graduate samples. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Table 4. (continued)

	$W_{ij} = 0 :$			$W_{ij} = 1 :$			$W_{ij} = 2 \text{ or } 3 :$		
	Not working			Working within FLSA hours limits			Violating FLSA hours limits		
	Dropouts	HS Graduates	dif	Dropouts	HS Graduates	dif	Dropouts	HS Graduates	dif
<i>Household Income</i>									
Less than \$ 25,000	77.7	74.0		9.5	12.6		12.7	13.4	
\$25,000 - \$44,999	63.6	67.6		11.4	14.8		25.0	17.5	**
\$45,000 - \$74,999	64.7	64.9		17.2	19.3		18.1	15.8	
\$ 75,000 or more	61.4	60.6		13.6	23.7		25.0	15.9	
<i>Residence Area</i>									
Rural	71.3	63.7	*	13.5	17.7		15.2	18.6	
Urban	71.6	67.8	*	10.7	17.6	*	17.6	14.6	*

Note. There are 608 dropouts and 3384 high school graduates in the sample. dif represents the test of difference in means between high school dropout and high school graduate samples. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Table 5. Ordered Probit estimation of employment status at ages 14 and 15 on state child labor laws and control variables

Variable	Employment status at age 14			Employment status at age 15		
Work Permit Requirement	-.023		-.028	-.019		-.022
Under age 18 ($D^W = 1$)	(.049)		(.049)	(.044)		(.044)
Compulsory schooling attendance above age 16 ($D^S = 1$)		-.084	-.085		-.034	-.036
		(.051)	(.051)		(.045)	(.045)
8 th Grade GPA	.012	.011	.010	.011	.010	.010
	(.037)	(.036)	(.037)	(.033)	(.033)	(.033)
Male	.333***	.334***	.333***	.167***	.167***	.167***
	(.050)	(.050)	(.050)	(.045)	(.045)	(.045)
Black	-.348***	-.344***	-.344***	-.410***	-.404***	-.405***
	(.070)	(.070)	(.070)	(.061)	(.061)	(.061)
Hispanic	-.245***	-.227***	-.225***	-.412***	-.406***	-.404***
	(.073)	(.074)	(.074)	(.067)	(.068)	(.068)
Urban	-.110**	-.109**	-.109**	-.021	-.021	-.021
	(.054)	(.054)	(.054)	(.049)	(.049)	(.049)
Log Household income(10000\$)	.003	.003	.003	.012**	.011**	.011**
	(.006)	(.006)	(.006)	(.005)	(.005)	(.005)
Father Education	-.002	-.002	-.002	-.001	-.001	-.001
	(.006)	(.006)	(.006)	(.005)	(.005)	(.005)
Mother Education	-.002	-.002	-.003	-.009	-.009	-.010
	(.007)	(.007)	(.007)	(.006)	(.006)	(.006)
Broken Family	-.132	-.132	-.134	.064	.065	.063
	(.072)	(.071)	(.072)	(.063)	(.063)	(.063)
Constant	-.820	-.784	-.765	-.459	-.449	-.434
μ_1	.656***	.656***	.656***	.570***	.570***	.570**
	(.030)	(.030)	(.030)	(.023)	(.023)	(.023)
μ_2	.998***	.998***	.999***	.829***	.830***	.830**
	(.041)	(.041)	(.041)	(.028)	(.028)	(.028)
Log-Likelihood	-2143.2	-2472.7	-2141.8	-2969.5	-2969.3	-2969.2
Pseudo R2	.026	.026	.026	.018	.018	.018
N	3384	3384	3384	3384	3384	3384
Test of H_0 : two state laws are not jointly significant			Chi2 = 3.03 $p = .220$			Chi2 = .81 $p = .666$

Note. Standard errors are in parenthesis. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Table 6. Marginal effect of rigor of state child labor law on employment status

	$W_{ij} = 0:$	$W_{ij} = 1:$	$W_{ij} = 2:$	$W_{ij} = 3:$
	Not working	Working within FLSA hours limits	Occasionally violating FLSA hours limits	Frequently violating FLSA hours limits
At age 14				
$(D^W = 1) - (D^W = 0)$	.006	-.004	-.001	-.002
$(D^S = 1) - (D^S = 0)$	.023	-.013	-.005	-.006
$(D^W = 1 \ \& \ D^S = 1) - (D^W = 0 \ \& \ D^S = 0)$	.031	-.017	-.006	-.007
At age 15				
$(D^W = 1) - (D^W = 0)$	.007	-.003	-.001	-.003
$(D^S = 1) - (D^S = 0)$	.013	-.005	-.002	-.006
$(D^W = 1 \ \& \ D^S = 1) - (D^W = 0 \ \& \ D^S = 0)$	.021	-.008	-.004	-.009

Note. D^W is a dummy variable indicating the state has work permit requirements that exceed federal requirements. D^S is a dummy variable indicating the state has compulsory school attendance requirements that exceed federal minimums. The reported numbers represent the estimated increase in the proportion of 14 or 15 year old youth in each employment category going from absence to presence of the respective state child labor law.

Table 7. Regressions explaining high school completion, college entry and high school GPA as a function of state child labor laws and control variables

Variables	High school completion ¹	College entry ¹	High school GPA ²
Work Permit Requirement Under age 18 ($D^w = 1$)	.013 (.009)	.030* (.017)	-.005 (.019)
Compulsory schooling attendance above age 16 ($D^s = 1$)	.012 (.009)	-.003 (.018)	.062*** (.019)
8 th grade GPA	.107*** (.007)	.262*** (.013)	.611*** (.013)
Male	-.015* (.009)	-.068*** (.017)	-.115*** (.019)
Black	.036*** (.009)	.066*** (.022)	-.116*** (.025)
Hispanic	.020* (.011)	-.002 (.025)	-.097*** (.027)
Urban	-.017* (.010)	.054*** (.020)	-.066*** (.021)
Log Household income (\$10000)	.014*** (.002)	.028*** (.003)	.011*** (.002)
Father's education	.002** (.001)	.003* (.002)	.006*** (.002)
Mother's education	.006*** (.001)	.017*** (.002)	.005** (.002)
Broken family	-.047*** (.013)	-.077*** (.024)	-.016 (.027)
Constant			.962*** (.058)
R ²			0.442
Pseudo R ²	0.235	0.211	
N	3992	3992	3992
Test of H_0 : two state laws are not jointly significant	Chi2 = 4.06 $p = .132$	Chi2 = 3.18 $p = .204$	F = 5.36 $p = .005$

Note. ¹ Marginal effects reported from a probit regression

² OLS regression

Standard errors are in parenthesis. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level..

Table 8. Regressions explaining high school completion, college entry and high school GPA as a function of employment status during the school year and control variables

Variables	High school completion ¹	College entry ¹	High school GPA ²
<i>A. Employment status at age 14</i>			
$W_{ij} = 1$: Working within FLSA hours limits	.037*** (.011)	.035 (.027)	.011 (.029)
$W_{ij} = 2$: Occasionally violating FLSA hours limits	-.058** (.031)	.005 (.047)	-.066 (.052)
$W_{ij} = 3$: Frequently violating FLSA hours limits	.007 (.023)	.003 (.048)	-.024 (.053)
<i>B. Employment status at age 15</i>			
$W_{ij} = 1$: Working within FLSA hours limits	.025** (.012)	.032 (.025)	.020 (.027)
$W_{ij} = 2$: Occasionally violating FLSA hours limits	-.002 (.020)	.074* (.039)	-.026 (.044)
$W_{ij} = 3$: Frequently violating FLSA hours limits	-.013 (.016)	-.039 (.031)	-.024 (.033)

Note. ¹ Marginal effects are reported from a probit regression

² OLS regression.

All coefficients are derived from regressions that use the same controls as in Table 7.

The reference group includes students who never work at all during the school year

Standard errors are in parenthesis. *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Appendix Table 1. Child labor provisions in the Fair Labor Standards Act

<i>Nonagricultural Jobs</i>			
Age	Permissible jobs	Hours of work	Times of day
13 or younger	Casual free-lance jobs such as babysitting and delivering newspapers	NA	NA
14 and 15	Non-manufacturing, non-mining, non-hazardous jobs ¹	Up to 3 hours on a school day and 18 hours in a school week; up to 8 hours on a non-school day and 40 hours in a non school week	Between 7am and 7pm except from June 1 through Labor Day, when evening hours are extended to 9 pm
16 and 17	Non-hazardous jobs	No restrictions	No restrictions
<i>Agricultural Jobs</i>			
Age	Permissible jobs	Hours of work	Times of day
Under 12 years	Jobs on farms owned or operated by parent(s) or non-hazardous jobs on farms	Outside of school hours	With a parent's written consent or on the same farm as the parent(s)
12 and 13	Non-hazardous jobs	Outside of school hours	With a parent's written consent or on the same farm as the parent(s)
14 and 15	Non-hazardous jobs	Outside of school hours	
16 and older	Any jobs	Unlimited	

Note. ¹ For example, occupations involving transportation, construction, warehousing, or communication, or occupations involving the use of power-driven machinery are regarded as hazardous jobs.

Appendix Table 2. Listing of states by age of work permit requirement

Age required for work permit	States affected	Total number
None	Arizona, Florida, Idaho, Kentucky, Montana, Nevada ¹ , Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Wyoming	13
Under age 16	Arkansas, Colorado, Connecticut, Hawaii, Illinois, Iowa, Kansas, Maine, Massachusetts, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, Rhode Island, Vermont, Virginia, West Virginia	22
Under age 18	Alabama, Alaska ² , California, Delaware, District of Columbia, Georgia, Indiana, Louisiana, Maryland, Michigan, New Jersey, New York, North Carolina, Pennsylvania, Washington, Wisconsin	16

Note. ¹Permit required for working at under age 14. Since this study deals with working at ages 14 and older, the requirement is not effective.

² Permit required under age 17 or under age 19 if the employer is licensed to sell alcohol.

Appendix Table 3. Listing of states by legal dropout age

Age allowed to leave school	States affected	Total number
Age 16	Alabama, Alaska, Arizona, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Rhode Island, South Dakota, Vermont, West Virginia, Wyoming	29
Age 17	Arkansas, Maine, Mississippi, Nevada, Pennsylvania, South Carolina, Tennessee	7
Age 18	California, District of Columbia, Hawaii, Indiana, Louisiana, Nebraska, New Mexico, Ohio, Oklahoma, Oregon, Texas, Utah, Virginia, Washington, Wisconsin	15

Appendix Table 4. Estimated probability of work status given the presence or absence of various state child labor laws, all other factors set at sample means. Estimates based on the coefficients reported in Table 5

	$W_{ij} = 0 :$	$W_{ij} = 1 :$	$W_{ij} = 2 :$	$W_{ij} = 3 :$
	Not Working	Working within FLSA hours limits	Occasionally violating FLSA hours limits	Frequently violating FLSA hours limits
<u>At age 14</u>				
$D^W = 0$	.816	.124	.031	.029
$D^W = 1$	.823	.120	.030	.027
$D^S = 0$	.809	.128	.033	.031
$D^S = 1$	.832	.115	.028	.025
$D^W = 0 \text{ \& } D^S = 0$	.805	.130	.033	.032
$D^W = 1 \text{ \& } D^S = 0$	.813	.126	.032	.030
$D^W = 0 \text{ \& } D^S = 1$	.829	.117	.029	.026
$D^W = 1 \text{ \& } D^S = 1$	.836	.113	.027	.024
<u>At age 15</u>				
$D^W = 0$	.710	.159	.047	.084
$D^W = 1$	.717	.157	.046	.081
$D^S = 0$	.708	.160	.047	.085
$D^S = 1$	.720	.155	.045	.079
$D^W = 0 \text{ \& } D^S = 0$	.703	.162	.048	.087
$D^W = 1 \text{ \& } D^S = 0$	.711	.159	.047	.083
$D^W = 0 \text{ \& } D^S = 1$	.717	.157	.046	.081
$D^W = 1 \text{ \& } D^S = 1$	.724	.154	.045	.077

Note. D^W and D^S are dummy variables reflecting the rigor of state child labor laws in terms of work permit requirement and compulsory school attendance respectively.

Appendix Table 5. Definition of variables and summary statistics (N=3992)

Variables	Definition	Mean	Std.Dev.	Min	Max
<i>Dependent</i>					
HS complete	Dummy: one if having completed high school, zero if otherwise	84.7	.359	0	1
HS GPA	Overall marks they received from the 9 th to the 12 th grade. It ranged from 1(below D) to 8(Almost A) and translated into 4.0	2.86	.783	.5	4
College entry	Dummy: one if having attended college, zero if otherwise	.572	.495	0	1
Work Status14	Employment intensity ordered response representing progressively higher values at age 14	.280	.678	0	3
Work Status15	Employment intensity ordered response representing progressively higher values at age 15	.508	.935	0	3
<i>Independent</i>					
Work permit	Dummy: one if state required work permit under 18, zero if otherwise	.503	.500	0	1
School leave	Dummy: one if state required students to stay above 16, zero if otherwise	.463	.499	0	1
8 th grades	Overall marks they received at 8 th grade. It ranged from 1(below D) to 8(Almost A) and translated into 4.0 scale	3.04	.755	.5	4
Male	Dummy: one if male, zero if female	.481	.500	0	1
Black	Dummy: one if black, zero if otherwise	.246	.431	0	1
Hispanic	Dummy: one if Hispanic, zero if otherwise	.190	.392	0	1
Urban	Dummy: one living in urban areas, zero if living in rural areas	.715	.452	0	1
HH income	Average household income during the last 5 years (10000dollars)	5.44	4.57	0	32.9
Father education	Biological father or residential father's highest education level It ranged from 1(1 st grade) to 20(8 th year college)	13.1	3.26	2	20
Mother education	Biological mother or residential mother's highest education level It ranged from 1(1 st grade) to 20(8 th year college)	12.8	2.95	1	20
Broken family	Dummy: if there is at least one missing biological parents, zero if students living with both biological parents.	.439	.496	0	1