Do stricter teen driving laws reduce juvenile crime and substance abuse? *

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Abstract

We study the effect of the No Pass No Drive (NPND) laws, on crime and substance abuse among teenagers. Since the late 1980s, several U.S. states have set minimum academic requirements for teenagers to obtain driving licenses. Using data from the Federal Bureau of Investigation (FBI), we exploit variation across state and time to study the effect of NPND laws on crime and substance use. Results show that NPND laws reduce the incidence of males' Driving Under the Influence arrests. Moreover, consistent with previous research on externality effects of education, NPND laws led to a decrease in male juvenile crime rates. We also observe an increase in some white-collar crimes.

Further, to study crime within schools, we analyse microdata from the Youth Risk Behavior Survey (YRBS). Results suggest that NPND led to a decrease in incidence of substance abuse and crime within the school among both males and females.

Keywords : NPND Laws; Crime; Education

JEL Classification :K14; J24; J18.

PRELIMINARY & INCOMPLETE (Work in Progress). Kindly do not cite without permission.

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1 Introduction

Roughly 11 million offenders were arrested in the U.S. in 2012. Estimates of the monetary costs of crime range from around $9,000 for vehicle assault to up to $8.5 million for murder.[1] According to the Office of Juvenile Justice and Delinquency Prevention, nearly 20% of people arrested for violent crimes and more than 25% of persons arrested for property crimes in 2006 were under the age of 18 and boys represented 83% and 68% of these juvenile arrests respectively.[2]

Most of the traditional labor economics literature studying the determinants of crime measures how incapacitation, sanctions, prevention, and better opportunities in the licit labor market can reduce criminal behavior (for a review see Freeman, 1999). In recent years, there has been an increased interest in measuring the effects of policies that are not targeted to reduce crime although they do have an indirect effect. Special attention has been paid to policies increasing educational quality (Deming, 2011 and Levitt et al., 2006) or attainment (for a survey of both of these topics see Lochner, 2011).

Reducing crime through education can yield significant welfare gains. For instance, Lochner and Moretti (2004) estimate that a one percentage point increase in male high school graduation rates in 1990 would have decreased crimes by approximately 100,000 which would have saved an approximately $2 billion to the public.

There are many theoretical channels through which education can lead to a decrease in crime. First and foremost, higher education increases expected wages and therefore the opportunity cost of working in licit activities. Second, education can increase patience (Becker and Mulligan, 1997) and therefore increase the disutility of long-term punishments. Moreover, more patient individuals are less impulsive and therefore less prone to show an aggressive behavior that can foster crime.[3]

Third, education decreases other health risk-taking behaviors such as drinking (Cutler and Lleras-Muney, 2010) which can interact with crime. Education may also reduce

[1] RAND Cost of Crime Calculator.

[2] Violent crime includes murder, rape, robbery, and aggravated assault while property crime includes burglary, larceny, theft, and arson.

[3] Physiological literature has also measured a positive correlation between aggressiveness and impulsiveness. An example of this research is Ramirez and Rodriguez, 2006.

accident rates if more educated individuals are better and safer drivers (Barua and Vidal-Fernandez, 2012). Finally, educated individuals are more likely to interact with each other and therefore benefit from positive peer effects.

At the same time, it is important to note that the contemporaneous effects of schooling on crime can be ambiguous. On the one hand, staying in school might have a deterrence effect, but on the other hand, it might increase school-related crimes if problematic students are staying in school and committing crime as well as generating "rotten apple" negative peer effects.

This paper analyzes the effects of a policy commonly known as No Pass, No Drive (NPND) laws that restricts driving licenses to minors who are not attending school. Currently 26 states set minimum academic requirements for teenagers to obtain driving licenses. Using data from the Federal Bureau of Investigation (FBI) and Youth Risk Behavior Survey (YBRS), we exploit geographical and time variation in NPND laws to measure its effects on crime.

While NPND laws have been shown to increase high school graduation (Barua and Vidal-Fernandez, 2012) and therefore could potentially decrease crime, effects of NPND laws on crime are theoretically ambiguous and time-dependent. NPND laws can have a deterrence effect by keeping teenagers off the streets. However, these laws could also have a positive effect on crime if it forces "marginal" students, who are more likely to commit crime, to stay in school. In addition, an important negative consequence of the law could be that it may encourage teenagers to drive without licenses. This could have high social costs if such drivers are riskier and under insured.

Thus, the net effect of NPND laws will depend on the negative effect on crime through increased human capital and the possible path-dependent increase in traffic felonies and school-related crimes. Results from the FBI show that NPND laws significantly reduce the incidence of males' driving under the influence crimes. Moreover and consistent with previous research (Anderson, 2013) NPND laws decrease male juvenile violent-related crime rates at the expense of white-collar types of crime due to incapacitation and increase in education.

Further, to study crime within schools, we analyze microdata from the Youth Risk Behavior Survey (YRBS). Results suggest that NPND led to a decrease in incidence of substance abuse and crime within the school for both males and females.

The contributions of this paper are threefold. First, this is the first paper analyzing a policy that aims to make teenagers who have a preference from driving to stay in

school. Given the evidence that the largest gains from crime reductions come from policies that encourage high school completion (Lochner 2011), NPND laws seem to be a relative cost-effective policy. Second, we find NPND laws to be particularly effective within males and blacks, who are overrepresented in the inmate population and are therefore the group from which we should expect to yield the largest gains from crime reduction. Finally, this is the first paper analyzing both the contemporaneous and subsequent effects of an educational policy on crime.

2 No Pass No Drive Laws & Crime

Many states have laws linking a driver's license to school attendance and/or academic performance. According to these laws, commonly known as No Pass No Drive (NPND) laws, a minor can be denied a drivers license or his/her license can be revoked for one or more of the following reasons; academic deficiency, dropping out of school or excessive un-excused absences from school. Table 1 provides a summary of the requirements put forth by the twenty six states that have an NPND law in place.

The intent of the law is unanimous across states: students who fail to meet mandatory attendance requirements cannot apply for a driver's license. However, they can earn the right again by returning to school, qualifying for an exemption related to personal or professional circumstances or attaining the eligible age, i.e. 18 in most states (see Table 1). Some states also require that students meet certain academic expectations in addition to attendance. As shown in Table 1, among these 26 states, seventeen condition a student's driving privilege exclusively on compliance with attendance requirements. For the remaining states, other factors are also taken into account such as satisfactory academic progress and suspension or expulsion from school. Table 1 also shows that the minimum age at which the individual is bound by the law is 15 for a majority of the states.

NPND laws have become a popular, statewide carrot-and-stick approach used to address truancy and increase high school graduation rates. Barua and Vidal-Fernandez (2012) show that NPND laws led to a 5.1 percent increase in the probability of graduating from high school among Black males. Further, these laws were effective in reducing truancy and increased time allocated to school-work at the expense of leisure and work.

Theoretically, the effect of NPND laws on crime is ambiguous and time-dependent. NPND laws can have a deterrence effect by keeping teenagers off the streets. However,

these laws could also have a positive effect on crime if it forces "marginal" students, who are more likely to commit crime, to stay in school. In addition, an important negative consequence of the law could be that it may encourage teenagers to drive without licenses. This could have high social costs if such drivers are riskier and under insured.[4] Thus, the net effect of NPND laws will depend on the negative effect on crime through increased human capital and the possible path-dependent increase in traffic felonies and school-related crimes.

3 Data and Empirical Framework

3.1 FBI Uniform Crime Reports

To study the effect of NPND laws on crime we use the FBI Uniform Crime Reports from the year before the enactment of the first NPND law 1988, until 2008. The FBI provides law enforcement agencies with a handbook that explains how to classify and score offenses and provides uniform crime offense definitions across states. The monthly arrests data files gather information on the total number of arrests per 100,000 inhabitants by age, sex, race, and type of crime (murder, rape, property crime, embezzlement, drugs, and driving-related offenses).

We add up arrests by state and year for two reasons. First, our policy variable changes only at the state and year levels. Second, not all local agencies report the requested information, which introduces measurement error at the agency and/or county level. Therefore, in addition to state and year fixed effects, we control for state-specific time trends to account for time changes in agency reporting rates.

Although NPND laws can indirectly affect crime through education, we should expect a larger effect for age-specific driving-related crimes (such as Driving Under the Influence) because NPND laws also restrict teenagers from driving. Therefore, our baseline specification is given by:

$$\log(C_{jast}) = \beta_1 Treatment_{st} + \beta_2 X_{st} + S + Y + \varepsilon_{jast} \qquad (1)$$

[4] This effect can be somewhat mitigated because most states with NPND laws grant exemptions to students who need to work to support their families. Moreover, we have tested this theory using the Fatality Analysis Reporting System (FARS) that maintains data on fatal injuries suffered in motor vehicle traffic crashes in the US. Negative binomial regression models of the effect of NPND law on state level accident fatalities among teenagers using the data yielded negative but statistically insignificant results.

where, the outcome C are arrests per 100.000 population by type of crime j, age group a, state s, and year t. $Treatment_{st}$ is a dummy equal to one if the state s has a NPND in place in a particular year. S and Y are state and year indicators, respectively, X_{st} are a range of time-variant state-specific characteristics that control for socioeconomic conditions which can affect crime. These include macroeconomic variables, traffic related control variables and education specific controls. The macroeconomic variables include log of real per capita income, log of male population, unemployment rate, poverty rate and percentage of black populations. In addition we also control for size of the police force. Education related controls include the student teacher ratio, log of real teacher's salaries, log of real education expenditures and minimum dropout ages. We control for several traffic-related variables, namely, log of age-specific total number of driving licenses, log of vehicle miles travelled, whether there is a graduating licenses law in place, and dummy variables for primary and secondary seatbelt laws. All income and expenditure variables are inflation adjusted and errors are clustered at the state level (Duflo and Mullainathan, 2004).

The crucial identifying assumption is that different types of crime do not vary systematically in the treatment and control states over time through channels other than NPND laws. There could be potential sources of internal validity threats to this conventional identification assumption. First, if crime rates decrease due to other laws that being enacted around the same time, our estimates would be biased. Second, there could be mean reversion if there was a downward trend in crime in treatment states at the time of the enactment of NPND laws but not in control states. Third, the intervention could be a response to another unobservable factor that simultaneously influences both the NPND laws implementation and crime. For instance, the sudden increase in teen traffic violations could lead to states passing NPND laws.

We address threats to internal validity in several ways. First, we present evidence on the robustness of our key results to introducing a rich set of state-specific demographic, economic, and education characteristics. To address the issue of policy endogeneity caused by traffic related outcomes, we control for state level traffic control variables: the log of vehicle miles traveled, log of total driving licenses, and the log of total motor vehicle fatalities among 15 to 17 year olds. Third, we include state-specific linear time trends in the regressions. Finally, we directly test if our results are being driven by other laws that were being changed or passed in states around the same time as NPND

laws such as Compulsory Attendance Laws, graduate driving and seatbelt laws.

Table 2 depicts descriptive statistics of arrests across states during 1988-2008 by race and type of crime. In the last column we can see that Blacks are over-represented in all types of crimes except from drunkenness and driving under the influence (DUI). Moreover, the proportion of Black arrests is the highest amongst more severe crimes such as murder, robbery and rape.

3.2 Youth Risk Behavior Survey

While NPND Laws might either have a direct impact on crime through an increase in educational levels, it might also well be the case that a potential offender with a strong preference for driving might stay in school to retain driving privileges while conducting his illegal activities inside instead of outside school. Because it might be well be the case that crime inside school might end up being largely unreported or sorted out internally without involving the police, we complement our FBI results with the Youth Risk Behavior Survey (YRBS). The YRBS is a national survey administered by the Centers for Disease Control and Prevention (CDC) every other year since 1991 that gathers information on risky behaviors of young adults in grades 9-12 such as tobacco, alcohol and drug use, and sexual and violent behavior. The objective of the survey is to identify the leading causes of morbidity and mortality among high school population.[5]

State education and health agencies conduct an almost identical[6] survey to the YRBS and include limited demographic characteristics that are going to be useful for our analysis such as grade, age, gender and race. While not all fifty states administer the state-level survey each year, since it's first release in 1991, the proportion of states joining the survey has steadily increased.[7]

The CDC kindly provided us with the state-level surveys of states that had previously agreed to share state-level data to researchers between 1991 and 2007. Despite its caveats, the YRBS has been widely used by economists to study range of policy-relevant issues involving sensitive youth behavior topics that are usually limited in other school

[5] For additional information about survey methodology of the YRBS see CDC, 2004.

[6] Some states add additional items in certain years while occasionally some states do not include a set of items asked in the national version of the questionnaire. For example, Utah does not include survey questions related to sex behavior.

[7] Table A.1 in the Appendix provides a list of states with public and available access to the data. We are currently in the process of contacting the relevant state-level agencies to gather as much data as possible.

survey data.[8] While we find a link between survey implementation and the passage of NPND Laws unlikely, to minimize this concern, we include state, year and time-varying economic (log of real per capita income, unemployment rate and poverty rate) and education controls (student teacher ratio, log of real teacher's salaries, log of real education expenditures) as in our previous estimating equation (1).[9]

4 Results

Table 3 show results of the effects of NPND Laws on different types of juvenile crime for males controlling for Compulsory Attendance Laws. While the effect of NPND laws on juvenile crime seems to be slightly positive but insignificant, we further explore whether there exist heterogeneous effects of NPND Laws depending on the type of crime and age group. On the one hand, we should expect a decrease in violent crimes committed outside school because NPND Laws increase education (Barua and Vidal-Fernandez, 2013) but also due to incapacitation. On the other hand, we should find increases in white-collar type of crimes due to an increase in education (Anderson, 2013) as well as a possible increase in school-related offenses that might not be reported to the police.[10]

Consistent with our predictions, Table 3 shows that in states with NPND laws, embezzlement arrests of 16-19 year olds increase between 0.25-0.3 percentage points (outcome variable is logs). Similarly, forgery arrests are significantly higher in states with NPND laws, while the likelihood of arrests for violent crimes such as manslaughter, assault, and robbery significantly decrease in similar magnitudes for older teenagers.

In Table 4, we present results for Driving Under Influence (DUI) arrests. As expected, NPND laws reduce the incidence of males' DUI arrests. The effect is largest for 16 and 17 year old males and decreases with age until we see no effect among 20-24 year olds. In particular, a 16 year old male is 18% less likely to be arrested for DUI crime and this effect is significant at the 5% level. Among females, the effect is small and significant only for 16-17 year olds and only at the 10% level.

Next, we study the effect of NPND laws on crime and substance abuse within schools using the YRBS data. Table 5 describes the outcome variables that are used in

[8] Some examples are Anderson 2013 who analyzes the effects of Compulsory Attendance Laws (CAL) on juvenile crime or Carpenter and Cook (2008) on the effect of cigarette taxes on youth smoking.

[9] With the exception that state-speficic linear time-trends are not included because the survey is not available for all the states every year.

[10] Future versions of this paper will analyze school self-reported offenses.

the analysis. We show results for four variables that indicate substance abuse within school premises, namely, drugs, marijuana, alcohol and smoking. Three additional variables determine crime within schools, namely, fight, feeling threatened and feeling unsafe. All the variables except drugs, which is a dummy variable, are categorical with varying response coding. For example, the question on Marijuana use asks "During the last 30 days, how many times did you use marijuana at school?". The response is indicated in categories as 0 times, 1-2 times, 3-9 times, 10-19 times, 20-39 times and 40 times of more. We report estimates by gender, Table 6 shows results for males and Table 7 for females.

All regressions include state and year fixed effects. Regressions also include the full set of state and year specific macroeconomic and education controls used previously in the FBI analysis. In addition, we control for age and age-squared, dummies for Blacks, Whites and Hispanics. Since the YRBS data is implemented once every two years and not all states take part in the survey, we do not include state specific trend effects.

The results suggest that NPND had a large and significant negative effect on probability of using drugs in school among both males and females. Males also report a lower incidence of Marijuana use and smoking. Males are also less likely to skip school because they felt unsafe in school. Interestingly, the effect on females is much larger and statistically significant for all the outcome variables.

5 Robustness Checks

NPND Laws limit the privileges to drive for teenagers should therefore expect no effects in older cohorts and a decrease in driving-related offenses for teenagers. The last column of Table 3 shows that for older cohorts there is virtually no effect of NPND laws for any type of crime. Finally, we can see in Table 4 how NPND Laws significantly reduce the likelihood of driving under the influence arrests by 0.1-0.2 percentage points. It is important to note that the largest magnitude of the effect is for 16 year olds, which is consistent with the results of the effects of NPND Laws on dropout rates as found by Barua and Vidal-Fernandez (2013).

References

1. Anderson, D.M. 2013. (forthcoming), "In School And Out of Trouble? The Minimum Dropout Age and Juvenile Crime?" The Review of Economics and Statistics.

2. Barua, R. and M. Vidal-Fernandez 2013. "No Pass, No Play: Negative Incentives and Allocation of Time"

3. Becker, G. S. and C.B. Mulligan, 1997. "The Endogenous Determination of Time Preference," The Quarterly Journal of Economics, 112(3): 729-58.

4. Carpenter, Christopher and Cook, Philip. 2008. â€œCigarette Taxes and Youth Smoking: New Evidence from National, State, and Local Youth Risk Behavior Surveys.â€İ Journal of Health Economics 27: 287-299.

5. Centers for Disease Control and Prevention. 2004. â€œMethodology of the Youth Risk Behavior Surveillance System.â€İ Morbidity and Mortality Weekly Report 53: 1-14.

6. Cullen J.B., B.A.Jacob , and S. Levitt, 2006. "The Effect of School Choice on Participants: Evidence from Randomized Lotteries," Econometrica,74(5), 1191-1230.

7. Bertrand, M., Duflo E. & S. Mullainathan. 2004. "How Much Should We Trust Differences-in-Differences Estimates?." The Quarterly Journal of Economics, MIT Press, vol. 119(1), pages 249-275, February.

8. Freeman, R.B. 1999. The Economics of Crime. O. Ashenfelter & D. Card (ed.), 1999. Handbook of Labor Economics, Elsevier Science, Volume 3, Chapter 2.

9. Deming, D. J., 2011. "Better Schools, Less Crime," Quarterly Journal of Economics, 126, 2063-2115.

10. Lleras-Muney, A. (forthcoming) "Does Staying in School (and not Working) prevent Teen Drinking and Smoking?" Journal of Health Economics

11. Lochner, L. 2011. Non Production Benefits of Education: Crime, Health, and Good Citizenship. E. Hanushek, S. Machin and L. Woessmann (eds.), Handbook of the Economics of Education, Vol. 4, Chapter 2, Amsterdam: Elsevier Science.

12. Lochner, L. and E, Moretti, 2004. "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports," The American Economic Review 94 (1), 155-189.

13. Ramirez, J. M. and J.M. Andreu Rodríguez, 2006."Aggression, and some related psychological constructs (Anger, Hostility, and Impulsivity): comments from a research project." Neuroscience and Biobehavioural Reviews, 30 (3). 276-291.

14. U.S. Department of Education. "State Comparisons of Education Statistics: 1969-70 to 1996-97." NCES 98-018, Washington DC: 1998

15. U.S. Department of Education, Digest of Education Statistics, National Center for Education Statistics. 2009, 2010

Tables and Figures

Table 1: Summary of No Pass No Drive Laws in 2008

State	Attendance	Pass	Behavior	Min. Age	Max. Age
Alabama	Yes			13	19
Arkansas	Yes			14	18
California	Yes			13	18
Delaware	Yes			-	-
Florida	Yes			15	18
Georgia	Yes			15	18
Idaho	Yes			15	18
Illinois	Yes		Yes	-	18
Indiana	Yes		Yes	15	18
Iowa	Yes			-	18
Kansas			Yes	13	-
Kentucky		Yes		16	18
Louisiana			Yes	15	18
Mississippi		Yes		15	18
Nevada	Yes			14	-
New Mexico	Yes			-	-
North Carolina		Yes		15	18
Ohio	Yes			-	18
Oklahoma	Yes			14	18
Oregon			Yes	15	21
South Carolina	Yes			15	17
Tennessee	Yes	Yes	Yes	15	18
Texas	Yes			15	18
Virginia	Yes			16	18
West Virginia		Yes		15	18
Wisconsin	Yes			16	18

Table 2: Average yearly juvenile crime 1988-2008

	Blacks	Whites	Black to White rate
Murder	22	15.2	1.45
	(1.4)	(1.4)	
Manslaughter	0.81	2.1	0.39
	(0.05)	(0.1)	
Rape	36	48	0.75
	(1.5)	(2)	
Robbery	409	233	1.76
	(27)	(20)	
Agravated assault	466	636	0.73
	(20)	(38)	
Forgery	23	85	0.27
	(1)	(4)	
Embezzelment	7	14	0.50
	(0.5)	(0.8)	
Possession or carrying of weapons	279	472	0.59
	(12)	(32)	
Drug-related crimes	953	1,784	0.53
	(47)	(92)	
Drunkeness	34	350	0.10
	(3)	(33)	
Driving under the influence	14	281	0.05
	(0.7)	(10)	

In 100,000s. Standard deviations in parentheses.

Table 3: Effect of NPND Laws on Male Arrests

	(1) All Ages	(2) 16 Years	(3) 16-17 Years	(4) 16-18 Years	(5) 16-19 Years	(6) 20-24 Years
			All types of crime			
NPND	0.060	0.073	0.079	0.079	0.080	0.065
	(0.074)	(0.100)	(0.093)	(0.085)	(0.082)	(0.079)
CAL	-0.090*	-0.049	-0.057	-0.070	-0.075	-0.075
	(0.051)	(0.048)	(0.048)	(0.048)	(0.047)	(0.049)
Observations	16628	978	1956	2934	3912	978
			Murder			
NPND	-0.081	-0.151	-0.103	-0.081	-0.104	0.001
	(0.049)	(0.169)	(0.145)	(0.120)	(0.113)	(0.002)
CAL	-0.073**	0.092	-0.065	-0.092	-0.117*	0.005
	(0.036)	(0.100)	(0.089)	(0.077)	(0.069)	(0.003)
Observations	8752	485	1011	1571	2132	880
			Manslaughter			
NPND	-0.006	0.025	-0.252**	-0.210**	-0.155	0.008
	(0.040)	(0.336)	(0.124)	(0.096)	(0.114)	(0.007)
CAL	-0.105***	0.358	-0.026	-0.017	0.021	-0.000
	(0.026)	(0.247)	(0.090)	(0.071)	(0.064)	(0.001)
Observations	5134	183	434	736	1041	811
			Rape			
NPND	-0.049	-0.179	-0.177	-0.151	-0.190*	0.003
	(0.044)	(0.144)	(0.131)	(0.101)	(0.103)	(0.002)
CAL	-0.077	-0.100	-0.104**	-0.086	-0.081	0.004*
	(0.047)	(0.060)	(0.051)	(0.063)	(0.066)	(0.002)
Observations	10047	606	1233	1867	2504	881
			Robbery			
NPND	-0.068	-0.203*	-0.184**	-0.169*	-0.188**	0.004
	(0.046)	(0.105)	(0.089)	(0.087)	(0.082)	(0.003)
CAL	-0.135***	-0.113	-0.140*	-0.124**	-0.130**	0.008
	(0.045)	(0.104)	(0.072)	(0.057)	(0.064)	(0.006)
Observations	9613	624	1265	1913	2550	884
			Assault			
NPND	0.005	-0.146**	-0.112*	-0.099	-0.104	0.002
	(0.041)	(0.066)	(0.061)	(0.066)	(0.071)	(0.002)
CAL	-0.099*	-0.072	-0.123**	-0.129**	-0.124**	0.006
	(0.054)	(0.050)	(0.052)	(0.053)	(0.057)	(0.004)
Observations	10512	645	1300	1956	2608	887
			Forgery			
NPND	0.210**	-0.104	0.045	0.055	0.106	0.000
	(0.098)	(0.099)	(0.091)	(0.080)	(0.088)	(0.001)
CAL	0.034	0.047	0.095	0.080	0.086	0.003
	(0.054)	(0.120)	(0.080)	(0.067)	(0.062)	(0.002)
Observations	10076	613	1253	1898	2545	886
			Embezzelment			
NPND	0.250**	0.075	0.318**	0.253*	0.231**	-0.009
	(0.097)	(0.257)	(0.149)	(0.129)	(0.105)	(0.012)
CAL	-0.122**	0.254	0.128	-0.067	-0.073	-0.010
	(0.059)	(0.169)	(0.130)	(0.112)	(0.082)	(0.012)
Observations	7748	425	900	1392	1887	868
			Illicit arrying of possession of weapons			
NPND	0.058	-0.124	-0.074	-0.064	-0.056	0.003
	(0.064)	(0.107)	(0.103)	(0.100)	(0.097)	(0.002)
CAL	-0.122**	-0.028	-0.065	-0.088	-0.108	0.006
	(0.047)	(0.078)	(0.075)	(0.074)	(0.079)	(0.004)
Observations	10330	643	1293	1943	2590	886
			Drugs			
NPND	0.009	-0.127	-0.108	-0.108	-0.103	-0.000
	(0.055)	(0.087)	(0.078)	(0.073)	(0.074)	(0.002)
CAL	-0.155***	-0.135	-0.149*	-0.134*	-0.129*	0.003*
	(0.052)	(0.085)	(0.078)	(0.069)	(0.067)	(0.001)
Observations	10534	649	1307	1965	2623	888
			Drunkenness			
NPND	-0.229**	-0.444*	-0.291	-0.299	-0.260	0.008
	(0.098)	(0.231)	(0.177)	(0.194)	(0.182)	(0.006)
CAL	-0.002	0.170*	0.161***	0.059	0.085	0.004*
	(0.097)	(0.092)	(0.058)	(0.066)	(0.067)	(0.002)
Observations	7804	449	925	1404	1883	727

Standard errors clustered at the state level in parentheses. Outcome variables in logs. *** denotes significance at 1%, ** at 5% and * at 10%. All include state, year and age fixed effects, state-specific linear time trends, the full set of state and year specific macroeconomic, traffic and education control variables and log of age-specific population.

Table 4: Effect of NPND on Driving Under the Influence Arrests

	All Ages	16 Years	16-17 Years	16-18 Years	16-19 Years	20-24 Years
	(1)	(2)	(3)	(4)	(5)	(6)
				Males		
NPND	0.013	-0.182**	-0.134**	-0.113**	-0.112*	0.002
	(0.068)	(0.084)	(0.065)	(0.055)	(0.057)	(0.002)
Observations	10467	622	1255	1892	2531	884
				Females		
NPND	0.057	-0.176	-0.123*	-0.068	-0.039	0.001
	(0.105)	(0.130)	(0.069)	(0.064)	(0.072)	(0.002)
Observations	10362	609	1238	1869	2505	884

Standard errors clustered at the state level in parentheses. Outcome variables in logs. *** denotes significance at 1%, ** at 5% and * at 10%. All include state, year and age fixed effects, state-specific linear time trends, the full set of state and year specific macroeconomic, traffic and education control variables and log of age-specific population.

Table 5: Description of Dependent Variables Used (YRBS)

Variable Name	Description
Drugs	Has Anyone Ever Offered you Drugs in School?
Marijuana	In the last 30 Days, how many times did you use Marijuna in School?
Alcohol	In the last 30 Days, how many times did you consume alcohol in School?
Smoking	In the last 30 Days, how many times did you smoke in School?
Fight	In the last 30 Days, how often were you in a physical fight in School?
Feeling Threatened	In the last 12 months, how many times has someone threatened you with a weapon?
Feeling Unsafe	In the last 30 days, how many days did you not go to school because you felt unsafe?

Drugs is a dummy variable. All other variables are categorical variables

Table 6: The Effect of NPND on Substance Use and Crime Among Males in School

	Drugs	Marijuana	Alcohol	Smoking	Fight	Feeling Threatened	Feeling Unsafe
NPND	-0.049***	-0.031**	-0.003	-0.083***	-0.017	-0.039	-0.032***
	(0.014)	(0.015)	(0.014)	(0.024)	(0.021)	(0.030)	(0.011)
Age	0.117***	-0.326***	-0.609***	-0.369***	-0.674***	-0.734***	-0.363***
	(0.029)	(0.067)	(0.103)	(0.112)	(0.083)	(0.105)	(0.061)
Age Squared	-0.003***	0.011***	0.019***	0.014***	0.020***	0.022***	0.011***
	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Black	-0.001	0.061**	0.028	-0.110***	0.060**	0.071**	0.041**
	(0.012)	(0.024)	(0.023)	(0.031)	(0.023)	(0.034)	(0.018)
White	0.061***	0.254***	0.230***	0.362***	0.328***	0.427***	0.181***
	(0.014)	(0.033)	(0.039)	(0.076)	(0.051)	(0.074)	(0.039)
Hispanic	-0.006	-0.021	-0.003	0.039	-0.061***	-0.053**	-0.055***
	(0.010)	(0.019)	(0.018)	(0.037)	(0.018)	(0.022)	(0.010)
Observations	115406	114943	114733	115067	118098	118308	117442

Standard errors clustered at the state level in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

All regressions include state and year fixed effects

Regressions include the full set of state and year specific macroeconomic and education controls

Table 7: The Effect of NPND on Substance Use and Crime Among Females in School

	Drugs	Marijuana	Alcohol	Smoking	Fight	Feeling Threatened	Feeling Unsafe
NPND	-0.044***	-0.019***	-0.018**	-0.153***	-0.035***	-0.028***	-0.061***
	(0.012)	(0.006)	(0.007)	(0.026)	(0.009)	(0.009)	(0.018)
Age	0.141***	-0.253***	-0.399***	0.005	-0.514***	-0.648***	-0.298***
	(0.025)	(0.060)	(0.082)	(0.107)	(0.115)	(0.121)	(0.063)
Age Squared	-0.005***	0.008***	0.012***	0.001	0.015***	0.020***	0.009***
	(0.001)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)
Black	-0.028**	0.018	0.018	-0.159***	0.084***	0.039***	0.011
	(0.010)	(0.012)	(0.012)	(0.032)	(0.014)	(0.011)	(0.013)
White	0.085***	0.158***	0.213***	0.328***	0.328***	0.313***	0.182***
	(0.020)	(0.031)	(0.036)	(0.061)	(0.054)	(0.066)	(0.043)
Hispanic	-0.002	-0.012	-0.019**	0.042	-0.039***	-0.040***	-0.056***
	(0.010)	(0.011)	(0.007)	(0.044)	(0.011)	(0.010)	(0.008)
Observations	119308	119172	119065	119271	122435	121614	120814

Standard errors clustered at the state level in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

All regressions include state and year fixed effects

Regressions include the full set of state and year specific macroeconomic and education controls

Appendix

Table A.1: Youth Risk Behavior Survey Publicly Available Data

State	**2007**	**2005**	**2003**	**2001**	**1999**	**1997**	**1995**	**1993**	**1991**
Alabama	0	1	1	1	1	1	1	1	1
Alaska	1	0	1	0	0	0	1	0	0
Arkansas	1	1	0	1	1	1	1	0	0
Connecticut	1	1	0	0	0	1	0	0	0
Delaware	1	1	1	1	1	0	0	0	0
Iowa	1	1	0	0	0	1	0	0	0
Idaho	1	1	1	1	0	0	0	1	1
Illinois	1	0	0	0	0	0	1	1	0
Kansas	1	1	0	0	0	0	0	0	0
Kentucky	0	1	1	0	0	0	0	0	0
Lousiana	1	0	0	0	0	0	0	0	0
Maryland	1	1	0	0	0	0	0	0	0
Maine	1	1	1	1	0	1	1	0	0
Missouri	1	1	1	1	1	1	1	0	0
Mississippi	1	0	1	1	1	1	1	1	0
Montana	1	1	0	1	1	1	1	0	0
North Carolina	1	1	1	1	0	0	1	1	0
North Dakota	1	1	1	1	1	0	1	0	0
Nebraska	0	1	1	0	0	0	0	1	1
New Jersey	1	1	0	1	0	0	0	0	0
NY	1	1	1	0	1	1	0	0	0
Oklahoma	1	1	1	0	0	0	0	0	0
Rhode Island	1	1	1	1	0	1	0	0	0
South Carolina	1	1	0	0	1	1	1	1	1
South Dakota	1	1	1	1	1	1	1	0	1
Tennessee	1	1	0	0	0	0	0	1	0
Utah	1	1	1	1	1	1	1	1	1
Wisconsin	1	1	1	1	1	1	0	1	0
West Virginia	1	1	1	0	1	1	0	1	0
Wyoming	1	1	0	1	1	0	1	0	0

Arizona, Colorado, Florida, Georgia, Hawaii, Indiana, Massachusetts, Michigan, Nevada, New Hampshire, New Mexico, Ohio, Texas and Vermont did not provide the CDC permission to share their data.