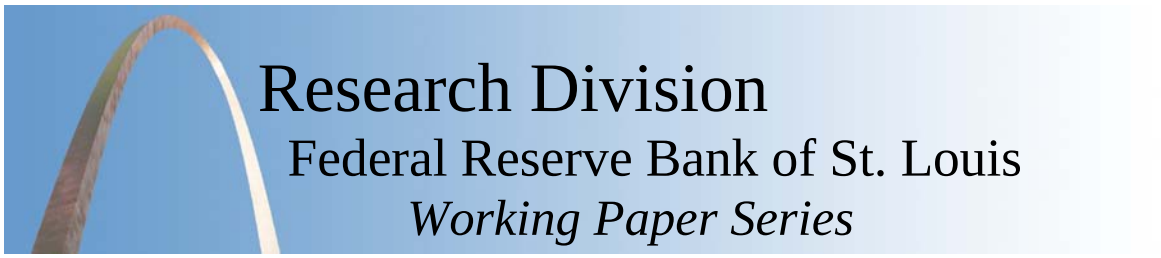

Out-of-School Suspensions and Parental Involvement in Children's Education

Maria E. Canon

Working Paper 2011-022A
http://research.stlouisfed.org/wp/2011/2011-022.pdf

September 2011

FEDERAL RESERVE BANK OF ST. LOUIS
Research Division
P.O. Box 442
St. Louis, MO 63166

Out-of-School Suspensions and Parental Involvement in Children's Education

Maria E. Canon[*†]

September 26, 2011

Abstract

Do parents alter their investment in their child's human capital in response to changes in school inputs? If they do, then ignoring this effect will bias the estimates of school and parental inputs in educational production functions. This paper tries to answer this question by studying *out-of-school* suspensions and their effect on parental involvement in children's education. The use of *out-of-school* suspensions is the novelty of this paper. *Out-of-school* suspensions are chosen by the teacher or the principal of the school and not by parents, but they are a consequence of student misbehavior. To account for the nature of these *out-of-school* suspensions, they are instrumented with measures of "principal's preference toward discipline." The estimates show that, without controlling for selection, the level of parental involvement is negatively correlated with the number of *out-of-school* suspensions. Once selection is accounted for, the effect disappears—that is, *out-of-school* suspensions do not affect parental involvement in children's education.

[*]Maria.E.Canon@stls.frb.org

[†]I would like to thank Ronni Pavan, Joshua Kinsler, and Juan Sanchez for helpful discussions and insightful comments. The views expressed are those of the author and do not necessarily reflect official positions of the Federal Reserve Bank of St. Louis, the Federal Reserve System, or the Board of Governors.

1 Introduction

The recent literature on estimates of educational production functions emphasizes the impact of school resources and family inputs on children's achievement. Todd and Wolpin (2003) point out that, when studying the education production process, a reasonable assumption is that the inputs are subject to choices made by parents and schools. A growing literature provides estimates of educational production functions that account for these choices (Canon (2010), Cunha (2008), Cunha and Heckman (2007, 2008), Lui, Mroz and van der Klaauw (2010), Todd and Wolpin (2006)). Particular attention has been given to how the levels of these inputs are influenced by each child's ability. Less attention has been given, partly due to lack of data, to the interaction between schools and parents.

Parents may alter the investment in their child's human capital in response to changes in schooling inputs. If there is a high degree of substitutability between parental and school inputs in the production of achievement, then increases in school inputs could crowd out parental inputs. Studies that fail to control for this effect might downward bias the effect of school inputs. If instead there exist complementarities between school and parental inputs, then increases in school inputs might increase parental involvement. Ignoring this effect might upward bias the role of parental inputs.

The goal of this paper is to empirically study whether parents alter the investment in their child's human capital in response to changes in schooling inputs by studying *out-of-school* suspensions and their effect on parental involvement. *Out-of-school* suspensions are defined as the removal of a student from the school environment for a period of time. Therefore, when students are suspended from school they diminish their learning opportunities. Do the parents of these students become more involved with their children?

The use of *out-of-school* suspensions is the novelty of this paper. Previous studies

(Bonesronning (2004), Datar and Mason (2008), Houtenville and Smith (2008), Lui, Mroz and van der Klaauw (2010)) look at the variation in parental involvement due to differences in school resources. They either assume that all the missing school inputs behave as the input included in the regression or infer parental involvement from maternal labor supply.

Because *out-of-school* suspensions are chosen by the class teacher or the principal of the school and not by the parents, they are a good candidate for exogenous (to parental choice) variation in the level of school resources across students. Also, *out-of-school* suspensions are a consequence of student misbehavior, and thus do not occurr randomly across students. Therefore, in order to capture the effect of how parents react to the decrease in school inputs, I use measures of "principal's preference toward discipline" as an instrument for the number of *out-of-school* suspensions. The identification comes from the fact that students in schools with stricter principals are more likely to be suspended. The estimates show that without controlling for selection, *out-of-school* suspensions are negatively correlated with the level of parental involvement. Once selection is accounted for, the effect disappears– that is, *out-of-school* suspensions do not affect parental involvement.

By studying the relation between *out-of-school* suspension and parental involvement, this paper also contributes to the school suspension literature. The education literature (Mendez (2003), Myers et al (1987)) finds a negative correlation between a student's suspensions from school and achievement. In the same vein, the Advancement Project and the Civil Rights Project (2000) conclude that the Zero Tolerance and School Discipline program has devastating consequences for students. Teachers assert instead the importance of maintaining a learning environment in which a student's right to an education is respected. Kinsler (2009b) finds that when student behavior and achievement are jointly modeled, suspensions deter students from misbehavior

but do not harm their performance, giving support to the teachers' argument. Hence, do parents compensate for this reduction in school inputs? Do parents become more involved when *out-of-school* suspensions occur?

The rest of the paper is organized as follows: Section 2 reviews the existing literature on the interaction between schools and parental inputs. Section 3 describes the data. Section 4 presents the empirical specification, describes the instruments, and presents the estimates. Section 5 concludes.

2 Literature Review

To date, few studies attempt to provide evidence for the complementarity or substitutability between school and parental inputs, and their results are mixed. Bonesronning (2004) explores the causal relation between schoolroom class size and parental involvement in a sample of lower secondary schools in Norway. The interaction between enrollment and a maximum class size rule of 30 students generates exogeneity in class size. The results show a weak and generally insignificant marginal effect of increasing parental effort when class size decreases by one, ranging between 0.01 and 0.02 standard deviation. For large shocks in class size (in schools with enrollments in the (30,35), (60,65) or (90,95) range) parents respond to a decrease in class size by increasing their own efforts, particularly for changes in class size at lower levels (15-17 students). Bonesronning concludes that the results support the hypothesis of complementarity response.

Datar and Mason (2008) also try to identify causal effects of class size on parental involvement. They look at students during kindergarten and first grade in the U.S. Their child fixed-effect and fixed effect instrumental variables estimates show that an increase in class size is associated with a decrease in parent-child interaction activities, no change in parent-school interaction activities, but an increase between 3% and 7%

of a standard deviation in parent-financed activities. Therefore the authors conclude that, at least in kindergarten and first grade, certain types of parental involvement are complements to class size, whereas other types of parental involvement are substitutes to class size.

Houtenville and Smith (2008) also estimate parental effort equations as a function of child, parent, household, and school characteristics for a sample of 10th grade students in the U.S. They look at the effect in parental involvement of per-pupil expenditures, teacher salaries, student/teacher ratio, class size, and the percentage of the student body not in the school subsidized program. The authors find a negative relation between school-related inputs and parental involvement, which suggests potential crowding out of school resources. To address the endogeneity of school inputs they use school district and state demographic characteristics as instruments for school inputs and find robust results.

Lui, Mroz, and van der Klaauw (2010) estimate a structural model of migration and maternal employment decision. Their main idea for the migration decision is that parents choose a place of residence in part because of employment opportunities and in part because of the characteristics of the schools in that district. Mothers make their employment decision knowing that their time has to be divided between work in the market and investing in her child. They infer whether parents substitute or complement inputs from this maternal employment decision. The idea behind this inference is that if school and home inputs are substitutes, we should expect mothers to spend less time with their children once they start school. The authors find that once they control for the fact that families might decide where to live because of school characteristics and labor market oportunities, school district characteristics reduce by two to four times. This could be explained if families whose children would anyways perform well are more likely to live in school districts with the highest productive inputs while at the same

time work more. In this case parental and school characteristics would be substitutes. However, as the authors point out, they use county-level school characteristics which for many locations might not be very realistic.

3 Data

The data used in this paper are drawn from the National Educational Longitudinal Survey of 1988 (NELS:88). NELS:88 is a nationally representative sample of eighth graders who were first surveyed in the spring of 1988. The survey follows the students for 12 years (1990, 1992, 1994, and 2000). Along with the student survey, NELS:88 included surveys of parents, teachers, and school administrators and represents an integrated system of data that tracked students from middle school through secondary and postsecondary education, labor market experiences, and marriage and family formation. (See Appendix A for more details about the survey's sample and characteristics of each of the five collection years.)

NELS:88 is a good survey for studying how much parents contribute toward their child's stock of human capital because it includes a large set of questions related to family activities that might improve or hinder students' test scores. At the same time, NELS:88 provides an extensive set of school inputs at the student level. All these characteristics might also be determinants of parental involvement.

From the 12,144 students in the entire NELS:88/2000 sample, I exclude those students that in 1988 belong to the "hearing impaired" sample; those students whose parent, teacher, or school administrator did not return the questionnaire; and those students with missing test scores.

Table 1 presents descriptive statistics. Kinsler (2009a) mentions that black students are more likely to be suspended from school; therefore I present all the statistics for the full sample and by race. The first part of the table presents demographic characteristics.

Parents of white students tend to be more educated; a higher proportion than the other groups have some college education or more. For example, 52% of white students have a father that attains some college or more, while the proportion is only 41% for black students. The differences between mothers' education for white and black students is much less: 48% have at least some college versus 43%, respectively.

Differences are also important for family income and family structure. The average family income for black students in 1988 was $23,700, while it was $40,800 for white students. Black students are also more likely to live in a single-parent household. In 1988, 13% of white students in the sample lived in a single-parent household, versus 36% of the black students. Black students also have on average more siblings than their white counterparts: an average of 2.69 for black students and 2.07 for white.

The proportion of black students that are suspended (12.1%) is more than two times that of whites (5.6%). This difference is in line with what Kinsler (2009a) finds for the sample of students from North Carolina. Finally, the table shows that black students perform on average one standard deviation lower than whites in their math test score.

Table 2 presents the statistics by income level. For students from families with income below the poverty line, differences across race are not that important. However, the proportion of white students below the poverty line is much lower than that of black students (9.2% for white versus 37.3% for blacks).

Tables 3 and 4 present descriptive statistics of parental involvement measures. Following the literature, I consider homework assistance, discussing things the child has studied in class, and attending school meetings as measures of parental involvement. The statistics show that differences in parental involvement are larger across family income level than across race. Parents with income above the poverty line are more likely to be involved, and, on average, are involved more often. Among families with income above the poverty line, 40.1% of the parents help with their child's homework

sometimes and 8.5% do so often. For students with family income below the poverty line, only 31.4% of the parents help them sometimes and 9% do so often. Differences are similar for many of the other measures of parental involvement.

4 Empirical Specification

As I guide to my empirical analysis, I set up model of household production and time allocation. The framework is similar to Todd and Wolpin (2003), but I focus on the choice of home inputs, parental effort, and school inputs. I assume that parents maximize utility derived from consumption, leisure, and their child's achievement:

$$max_{h,e,s} U(c, l, a)$$

subject to (i) a production function of achievement, (ii) a time contraint, and (iii) a budget constraint:(i) The production function of achievement (a) depends on school inputs $(s(t))$; parental involvement, i.e., home inputs, (e); and the child's ability to learn (η). Note that school inputs depend on the child's attendance, t, which can vary in the interval $[0; T]$ and where T is full attendance:

$$a = [\theta s(t)^{\kappa} + (1 - \theta)e^{\kappa}]^{\frac{\gamma}{\kappa}} \eta^{(1-\gamma)}$$

(ii) The time constraint, where h is the total number of hours worked, l is leisure, and e is parental involvement, is:

$$l = 1 - h - e$$

(iii) The a budget constraint is:

$$wh = c + s(T)p$$

Here I am assuming that parents choose the quality of the school, $s(:)$, and they pay the tuition independently of the child's attendance.

The optimal parental involvement can be obtained from the first-order conditions of the maximization problem:

$$e = \left[\frac{\theta}{(1-\theta)} \frac{w}{ps'(T)} s'(t) \right]^{\frac{1}{\kappa-1}} s(t)$$

The level of involvement will depend on the complementarity or substitutability of home and school inputs, as well as on the amount of school inputs– i.e., its quality, $s(:)$, and the child's attendance, t.

Ideally, one would like to study empirically the effect of school inputs on the probability of parents becoming involved in their child's achievement-related activities. However, the optimal level of parental involvement depends on the quality of the school, which is also chosen by parents. Therefore to be able to isolate the effect of school resources on how involved parents are in their child's school-related activities, I need to have some exogenous (to parental choice) variation in the level of school resources.

Out-of-school suspensions are chosen by the teacher or the principal of the school and therefore are a candidate for exogenous (to parental choice) variation in the level of school resources. The goal is to estimate the probability that parents get involved in their child's school-related activities as follows:

$$\Pr(\text{“}pinvolvement\text{”} = 1) = \alpha_0 + \alpha_1 e_t + \alpha_2 s_t + \alpha_3 oss_t + \alpha_4 h_{t-1} + \eta_t \qquad (1)$$

where e_t is a vector of home characteristics in period t, s_t is a vector of school characteristics in period t, oss_t is the number of *out-of-school* suspensions in period t, and h_{t-1} is the lagged math test score.

Out-of-school suspensions are defined as the removal of a student from the school environment for a period of time. *Out-of-school* suspensions are in most cases a re-

sponse to the student's misbehavior and consequently not exogenous to the student's characteristics. Therefore, the estimates from equation (1) will be biased if there is unobserved heterogeneity that affects both *out-of-school* suspensions and parental effort. The problem arises if there is correlation between which students are suspended and characteristics of these students that are not included in the regression analysis. For instance, suppose that parents choose how much to help their child in school-related activities according to how much they value education. It could be then the case that students whose parents do not care about education also do not themselves care about education and might misbehave in school and receive more *out-of-school* suspensions. In that case, if we look at the relation between parental effort and *out-of-school* suspensions, we would underestimate the effect of parents compensating for the decrease in school inputs.

To avoid this underestimation, I propose obtaining exogenous variation by instrumenting the number of *out-of-school* suspensions with measures of the school principal's preference toward discipline. In the rest of this section, I explain how I construct such a measure and then present the estimation results.

4.1 Instrument

The school administrator completed one questionnaire each survey year. The administrator questionnaire gathered descriptive information about the school's teaching staff, the school climate, characteristics of the student body, and school policies and offerings. School administrators were asked, among other school policy questions, what happens in the school when a student breaks school rules. The school could take no action or take a minor disciplinary action. The school could also put the student in an in-school suspension or an out-of-school suspension or expel the student from the school. The events that principals were asked about are listed in Table 5. This table shows the

percentage of schools that use *out-of-school* suspensions for each of those events.

One caveat is that principals might want to punish a certain action or event if that event is a common problem among the students in the school. If students that misbehave are in schools with a higher proportion of misbehaving peers and thus, principals are stricter, the measure will still be correlated with the student's type and therefore will not be a valid instrument.

In their questionnaire, principals were asked if the events in Table 5 were a problem among the students in their school as well as the severity of the problem. This information allows me to overcome the caveat just mentioned. Table 6 shows the percentage of schools where each of the events is a moderate or severe problem. While some events such as absentism or alcohol use are a moderate or severe problem in more than half of the schools in the sample, other events such as physical abuse of teachers is a problem in only 26.1% of the schools.

Table 5 shows the percentage of schools that use *out-of-school* suspensions for each event. Table 6 shows the percentage of schools where each of these events is a moderate or severe problem. However, these tables do not show how many schools use *out-of-school* suspensions as a deterrent to prevalent problems among their students. Knowing which, if any, schools use suspensions to deter an existing problem is important for determining variation in school policies. To study this I construct two measures, which are presented in Tables 7 and 8.

The first measure, presented in Table 7, is how many schools use *out-of-school* suspensions to deter an existing problem. For this measure I calculate how many schools meet both these criteria: the event is a moderate or severe problem and *out-of-school* suspensions (OSS) are used as a deterrent for the event; I then calculate this measure as a fraction of all the schools where each event is a severe or moderate problem. Almost half of the schools where alcohol possession is a problem use an *out-of-school*

suspension as a disciplinary response. Yet, only a very small fraction of schools where physical abuse of teachers is a problem use an *out-of-school* suspension for that event.

Table 8 shows the schools that meet both criteria: the event is a moderate or severe problem and the school used an *out-of-school* suspension as a disciplinary response, as a fraction of all the schools that suspend for each event. As for the previous measure, we observe dispersion in principals' disciplinary actions. While nearly 60% of schools that use an *out-of-school* suspension for skipping school considered it a moderate or severe problem, only 0.3% of the out-of-school suspensions for physical abuse of teachers were from schools where it was a significant problem.

Table 7 and Table 8 give evidence that variation exists in schools' disciplinary decisions. There are schools where a certain event is a problem among their students, but the school does not take a disciplinary action. In some other schools, instead, a principal suspends students even though the event is not a moderate or severe problem.

To get measures of the principals' preference toward discipline, I proceed as follows. For each event I regress the disciplinary decision that the principal takes on whether this event is a particular problem among the students at the school. The explanatory variable takes four values indicating the severity of the problem: not a problem, a minor problem, a moderate problem, and a serious problem. I keep the residual as the toughness of the principal regarding that event– or the principals' preference toward discipline. The identifying assumption is the following: Consider two schools where a certain action is not a problem among the students. In one of those schools, students receive an *out-of-school* suspension for taking that action; in the other, students do not receive a suspension. Students in the first school, therefore, are more likely to be suspended independently of their type. In my analysis, I do not consider cheating on tests, smoking at school, class disturbance, and profanity in class because I cannot control for whether it is a problem at the school or not.

4.2 Estimation Results

The results estimating the effect of *out-of-school* suspensions are presented in Tables 9 through 12. Table 9 shows the probit estimates of equation (1) for the different measures of parental involvement. The estimates for all measures are negatively correlated with *out-of-school* suspensions, and these relations are statistically different from zero. For the mean student, an infinitesimal increase in *out-of-school* suspensions decreases the probability of parental help with homework by 1.7% and decreases the probability that parents check their child's homework by 1.7% as well. *Out-of-school* suspensions also decrease the probability that the student will discuss classwork with his parent by 2.2%, and decreases the probability that the child and his parents will discuss course selection by 1.7%. Performing higher on 8th grade math test scores decreases the probability of parental involvement in homework-related activities, but increases the probability of parental participation in selecting courses. These results jointly give evidence that selection might be affecting the results. This revisits the argument that parents choose how much they become involved in their child's school-related activities based on how much they value education. Then, if it is the case that students whose parents do not value education much also do not value education, they are more likely to both be suspended and perform lower in their math test score. On the other end of the test score distribution, students that perform very well do not need help with their homework. But, if their parents value education, they will discuss course selection with their child.

Therefore, to obtain causal estimates I have at least two alternatives. One option is to evaluate students' fixed effects. By taking first differences I eliminate all students', families', and schools' characteristics that remain fixed over time. Alternatively, I can instrument the number of *out-of-school* suspensions with a variable that is correlated with *out-of-school* suspensions but uncorrelated with unobserved characterists affecting both the level of parental involvement and *out-of-school* suspensions. Unfortunately, not

all the parental variables presented in Table 9 are observed both in 10th and 12th grade. Therefore I will first show the results when I instrument *out-of-school* suspensions. I will then estimate first differences for the two measures that are observed over time, as a robustness for the instrumental variables.

Table 10 shows the first-stage estimates for the case where *out-of-school* suspensions are instrumented by measures of principals' preference toward discipline. Some of the measures of how strict the principal is are useful for predicting the number of out of school suspensions. Being more strict on the use of illegal drugs at school is negatively correlated with the number of *out-of-school* suspensions, while students with principals that are stricter in terms of abuse of teachers receive more *out-of-school* suspensions.

Table 11 shows the estimates when *out-of-school* suspensions are instrumented by measures of a principal's preference toward discipline. Once *out-of-school* suspensions are instrumented they are no longer statistically significant in explaining parental involvement. This result is consistent across all measures of parental involvement. These results are consistent with Bonesronning (2004) who finds a weak and generally insignificant marginal effect of increasing parental effort when class size decreases for a sample of lower secondary schools in Norway.

An alternative to avoid student characteristics contaminating the effect of *out-of-school* suspensions on parental involvement is to estimate first differences. Unfortunately not all the parental variables presented in Tables 9 and 11 are observed both in 10th and 12th grade. Table 12 presents the first difference estimates of *out-of-school* suspensions in the change in parental involvement. The results are in line with the results in Table 11: *Out-of-school* suspensions do not significantly affect parental involvement.

5 Concluding remarks

This paper examines whether parents responded to changes in school inputs. In particular I focus my analysis on *out-of-school* suspensions. *Out-of-school* suspensions are chosen by the principal and the teacher of the school and are therefore exogenous to parental choice. Also, *out-of-school* suspensions are a consequence of student misbehavior, and thus do not occurr randomly across students. Therefore, in order to obtain causal estimates of the effect of school inputs on parents' involvement, I instrument the number of *out-of-school* suspensions with measures of "principal's preference toward discipline." I show that the instrument predicts the number of *out-of-school* suspensions. The estimates show that, without controlling for selection, *out-of-school* suspensions are negatively correlated with the level of parental involvement. Once selection is taken into account, the effect disappears. At least for this sample, parents of 10th graders do not tend to adjust their involvement in their child's education to changes in school inputs. This result is in line with Bonesronning (2004).

For the literature in *out-of-school* suspensions, the results on this paper support the hypothesis that *out-of-school* suspensions do not have a significant impact on students' achievement. Parents' of students that get suspended are not more involved. That is, there is no evidence that these parents are compensating their child for the forgone school inputs.

References

[1] Blau, D and Currie, J (2006). "Pre-School, Day Care, and After-School Care: Who's Minding the Kids?" The Handbook of Economics of Education, Hanushek, E and Welch, F eds.

[2] Bonersronning, H (2004). "The determinants of parental effort in education production: do parents respond to changes in class size?" Economics of Education Review 23: 1-9.

[3] Cameron, S and Heckman, J (1998). "Life Cycle Schooling and Dynamic Selection Bias:Models and Evidence for Five Cohorts of American Males." Journal of Political Economy 106 (2).

[4] Canon, M (2010). "The role of schools in the production of achievement." Working paper

[5] Cunha, F (2008). "A time to plant and a time to reap." Working paper, University of Chicago.

[6] Cunha, F and Heckman, J. (2007a). "The Technology of Skill Formation." American Economic Review Papers and Proceedings, vol. 97(2): 31-47.

[7] Cunha, F and Heckman, J. (2008). "Formulating, Identifying, and Estimating the Technology for the Formation of Skills." Journal of Human Resources, Vol 43(4): 38-782.

[8] Datar, A. and Mason, B (2008). "Do reductions in class size "crowd out" parental investment in education?" Economics of Education Review 27: 712-723.

[9] Hanushek, E (1986). "The Economics of Schooling: Production and Efficiency in Public Schools." Journal of Economic Literature, Vol. 24(3): 1141-77.

[10] Houtenville, A. and Smith, K (2008). "Parental Effort, School Resources and Student Achievement." Journal of Human Resources, Vol. 63(2): 437-453.

[11] Heckman, J (2000). "Policies to Foster Human Capital." Research in Economics 54 (1): 3-56

[12] Heckman, J and Rubinstein, Y. (2001). "The importance of noncognitive Skills: Lessons from the GED Testing Program." American Economic Review Papers and Proceedings 91(2): 145-149.

[13] Kinsler, J (2009a). "Understanding the Black-White School Discipline Gap." Working paper, University of Rochester

[14] Kinsler, J (2009b). "School Policy and Student Outcomes in Equilibrium:Determining the Price of Delinquency." Working paper, University of Rochester

[15] Liu, H, Mroz, T and van der Klaauw, W (2010). "Maternal Employment, Migration and Child Development." Journal of Econometrics 156 (1): 212-228.

[16] Mendez (2003). "Predictors of suspension and negative school outcomes: a longitudinal investigation." New Directions for Youth Development, 99.

[17] Myers (1987). "Student Discipline and High School Performance." Sociology of Education 60.

[18] National Center for Education Statistics (2002). "Base-Year to Fourth Follow-up Data File User's Manual" U.S. Department of Education.

[19] Todd, P and Wolpin, K (2003). "On the Specification and Estimation of the Production Function for Cognitive Achievement." The Economic Journal 113 (485): F3-33.

[20] Todd, P and Wolpin, K (2006). "The Production of Cognitive Achievement: Home, School and Racial Test Score Gaps." Working paper, University of Pennsylvania.

[21] U.S. Department of Education Office for Civil Rights (2000). "Elementary and Secondary School Survey."

Table 1: Descriptive Statistics

Variable	Full Sample		White Students		Black Students		Hispanic Students	
	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)
Mother at Most High School	0.55		0.52		0.57	(0.50)	0.73	(0.45)
Mother Some College or More	0.45		0.48		0.43	(0.50)	0.27	(0.45)
Father at Most High School	0.51		0.48		0.59	(0.49)	0.68	(0.47)
Father Some College or More	0.50		0.52		0.41	(0.49)	0.32	(0.47)
Family Income	37,362	(29,734)	40,750	(30,084)	23,689	(22,725)	26,228	(22,679)
Single Parents	0.14		0.13		0.36		0.15	
Number of Siblings	2.24	(1.54)	2.07	(1.44)	2.690	(1.80)	2.79	(1.68)
% Suspended	0.071		0.056		0.121		0.078	
Math Test Results in 8th Grade	51.30	(9.96)	52.62	(9.83)	45.129	(7.85)	46.84	(8.16)
Math Test Results in 10th Grade	50.50	(9.92)	52.25	(9.59)	44.817	(8.52)	46.57	(8.54)
Math Test Results in 12th Grade	51.05	(9.73)	52.49	(9.34)	44.950	(8.42)	47.40	(8.64)

Table2: Descriptive Statistics by Income Level

Variable	Full Sample		White Students		Black Students		Hispanic Students	
	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)
Below Poverty Line								
Mother at Most High School	0.795		0.798		0.743		0.886	
Mother Some College or More	0.205		0.202		0.257		0.114	
Father at Most High School	0.787		0.788		0.758		0.872	
Father Some College or More	0.213		0.212		0.242		0.128	
Family Income	8410	(4781)	8756	(4427)	7238	(4576)	8728	(5088)
Single Parents	0.420		0.438		0.595		0.284	
Number of Siblings	3.154	(1.79)	2.846	(1.71)	3.256	(1.83)	3.506	(1.77)
% Suspended	0.114		0.112		0.172		0.080	
Math Test Results in 8th Grade	46.412	(8.19)	48.017	(8.54)	43.374	(6.70)	45.065	(7.06)
Math Test Results in 10th Grade	45.775	(8.71)	47.422	(8.83)	42.244	(7.29)	44.718	(7.90)
Math Test Results in 12th Grade	46.198	(8.76)	47.526	(8.90)	42.802	(7.38)	45.553	(8.09)
Above Poverty Line								
Mother at Most High School	0.499		0.494		0.483		0.645	
Mother Some College or More	0.501		0.506		0.517		0.355	
Father at Most High School	0.457		0.448		0.510		0.593	
Father Some College or More	0.543		0.552		0.490		0.407	
Family Income	42621	(29337)	44001	(29672)	33455	(23551)	34911	(23009)
Single Parents	0.117		0.108		0.267		0.097	
Number of Siblings	2.067	(1.42)	1.994	(1.38)	2.323	(1.65)	2.436	(1.52)
% suspended	0.054		0.050		0.085		0.068	
Math Test Results in 8th Grade	52.399	(9.98)	53.198	(9.80)	46.302	(8.33)	48.045	(8.66)
Math Test Results in 10th Grade	52.114	(9.71)	52.856	(9.48)	46.328	(8.89)	48.020	(8.70)
Math Test Results in 12th Grade	52.347	(9.45)	53.032	(9.21)	46.169	(8.80)	48.775	(8.70)

Table 3: Parental involvement measures

Variable Description		Full Sample		White Students		Black Students		Hispanic Students	
		Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)
FULL SAMPLE									
Discuss school courses	Never	0.178	(0.382)	0.151	(0.358)	0.209	(0.407)	0.218	(0.413)
with parent	Sometimes	0.627	(0.484)	0.650	(0.477)	0.578	(0.494)	0.596	(0.491)
	Often	0.195	(0.397)	0.199	(0.399)	0.214	(0.410)	0.185	(0.389)
Discuss class material	Never	0.198	(0.399)	0.182	(0.386)	0.198	(0.399)	0.222	(0.416)
with parent	Sometimes	0.605	(0.489)	0.614	(0.487)	0.595	(0.491)	0.603	(0.490)
	Often	0.196	(0.397)	0.204	(0.403)	0.207	(0.405)	0.176	(0.381)
How often parents	Never	0.180	(0.385)	0.182	(0.386)	0.147	(0.354)	0.163	(0.370)
check homework	Rarely	0.260	(0.439)	0.271	(0.444)	0.230	(0.421)	0.241	(0.428)
	Sometimes	0.306	(0.461)	0.299	(0.458)	0.328	(0.470)	0.331	(0.471)
	Often	0.253	(0.435)	0.248	(0.432)	0.295	(0.456)	0.266	(0.442)
How often parents	Never	0.207	(0.405)	0.192	(0.394)	0.213	(0.410)	0.235	(0.424)
help with homework	Rarely	0.321	(0.467)	0.330	(0.470)	0.284	(0.451)	0.303	(0.460)
	Sometimes	0.387	(0.487)	0.397	(0.489)	0.375	(0.484)	0.374	(0.484)
	Often	0.085	(0.279)	0.082	(0.274)	0.128	(0.334)	0.088	(0.283)
How often parents attend	Never	0.500	(0.500)	0.481	(0.500)	0.472	(0.499)	0.546	(0.498)
school meetings	Once or twice	0.369	(0.483)	0.381	(0.486)	0.377	(0.485)	0.342	(0.475)
	More than twice	0.131	(0.337)	0.138	(0.345)	0.151	(0.358)	0.111	(0.315)

Table 4: Parental involvement measures, by level of family income

Variable Description		Full Sample		White Students		Black Students		Hispanic Students	
		Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)	Mean	(Std Dev)
Above Poverty Line									
Discuss school courses	Never	0.150	(0.357)	0.140	(0.347)	0.152	(0.359)	0.181	(0.385)
with parent	Sometimes	0.641	(0.480)	0.655	(0.476)	0.602	(0.490)	0.612	(0.488)
	Often	0.209	(0.407)	0.206	(0.404)	0.246	(0.431)	0.208	(0.406)
Discuss class material	Never	0.183	(0.386)	0.176	(0.381)	0.171	(0.377)	0.194	(0.396)
with parent	Sometimes	0.611	(0.488)	0.614	(0.487)	0.601	(0.490)	0.617	(0.486)
	Often	0.207	(0.405)	0.210	(0.407)	0.228	(0.420)	0.189	(0.392)
How often parents	Never	0.170	(0.375)	0.176	(0.381)	0.121	(0.327)	0.151	(0.358)
check homework	Rarely	0.264	(0.441)	0.269	(0.443)	0.220	(0.414)	0.256	(0.436)
	Sometimes	0.308	(0.461)	0.301	(0.459)	0.348	(0.477)	0.330	(0.471)
	Often	0.259	(0.438)	0.254	(0.435)	0.311	(0.463)	0.263	(0.441)
How often parents	Never	0.189	(0.391)	0.184	(0.387)	0.185	(0.389)	0.192	(0.394)
help with homework	Rarely	0.325	(0.468)	0.330	(0.470)	0.293	(0.456)	0.291	(0.454)
	Sometimes	0.401	(0.490)	0.403	(0.491)	0.393	(0.489)	0.426	(0.495)
	Often	0.085	(0.279)	0.083	(0.275)	0.128	(0.335)	0.091	(0.288)
How often parents attend	Never	0.471	(0.499)	0.463	(0.499)	0.405	(0.491)	0.527	(0.500)
school meetings	Once or twice	0.386	(0.487)	0.389	(0.488)	0.422	(0.494)	0.358	(0.480)
	More than twice	0.143	(0.350)	0.148	(0.355)	0.173	(0.379)	0.116	(0.320)
Below Poverty Line									
Discuss school courses	Never	0.274	(0.446)	0.263	(0.440)	0.291	(0.455)	0.263	(0.441)
with parent	Sometimes	0.581	(0.494)	0.602	(0.490)	0.562	(0.497)	0.577	(0.495)
	Often	0.145	(0.352)	0.135	(0.342)	0.147	(0.355)	0.160	(0.367)
Discuss class material	Never	0.259	(0.438)	0.252	(0.435)	0.237	(0.426)	0.261	(0.440)
with parent	Sometimes	0.587	(0.492)	0.602	(0.490)	0.602	(0.490)	0.569	(0.496)
	Often	0.154	(0.361)	0.145	(0.353)	0.162	(0.369)	0.170	(0.376)
How often parents	Never	0.215	(0.411)	0.247	(0.432)	0.185	(0.389)	0.168	(0.375)
check homework	Rarely	0.259	(0.438)	0.298	(0.458)	0.237	(0.426)	0.218	(0.413)
	Sometimes	0.305	(0.461)	0.281	(0.450)	0.318	(0.466)	0.345	(0.476)
	Often	0.220	(0.414)	0.174	(0.380)	0.260	(0.439)	0.269	(0.444)
How often parents	Never	0.282	(0.450)	0.274	(0.446)	0.256	(0.437)	0.289	(0.454)
help with homework	Rarely	0.314	(0.464)	0.318	(0.466)	0.282	(0.451)	0.339	(0.474)
	Sometimes	0.314	(0.464)	0.324	(0.468)	0.343	(0.475)	0.281	(0.450)
	Often	0.090	(0.286)	0.084	(0.278)	0.119	(0.324)	0.091	(0.288)
How often parents attend	Never	0.616	(0.487)	0.643	(0.479)	0.592	(0.492)	0.575	(0.495)
school meetings	Once or twice	0.306	(0.461)	0.302	(0.459)	0.307	(0.462)	0.321	(0.468)
	More than twice	0.079	(0.270)	0.055	(0.229)	0.101	(0.302)	0.104	(0.306)

Table 5: School policies for out-of-school suspensions

Event	Proportion that Suspend
Cheating	8.7
Skipping classes	16.8
Skipping school (1 or 2 days)	28.5
Skipping school (3 + days)	45.2
Physical injury to students	85.7
Possess alchohol	80.8
Possess drugs	73.9
Sell Drugs	44.0
Possess Weapons	50.7
Use alcohol at school	80.2
Use drugs at school	72.9
Smoke at school	46.3
Verbally abuse teachers	68.2
Physically abuse teachers	39.3
Theft of school property	77.9
Class disturbance	30.4
Profanity in class	35.8

Table 6: School Characteristics

Event	Proportion Listing as Moderate or Severe Problem
Absentism	65.7
Physical conflicts among students	35.2
Use of alcohol	54.3
Use of illegal drugs	44.1
Verbal abuse of teachers	31.5
Physical abuse of teachers	26.1
Robbery or theft	32.5

Table 7: Schools that use OSS and event is a problem as a fraction of schools where event is a problem

Event ↓	
Skipping school	20.2
Physical injury to students	24.1
Use of alcohol at school	42.9
Use of illegal drugs at school	32.7
Verbally abuse teachers	11.5
Physically abuse of teachers	0.4
Theft of school property	19.1

Table 8: Schools that use OSS and event is a problem as a fraction of schools that suspend

EVENT ↓	
Skipping school	59.5
Physical injury to students	13.3
Use of alcohol at school	38.7
Use of illegal drugs at school	26.6
Verbally abuse teachers	6.8
Physically abuse of teachers	0.3
Theft of school property	10.9

Table 9: Estimates parental involvement measures

	Help with hw	Check hw	Material studied in class	Course selection
Suspensions	-0.065	-0.070	-0.091	-0.077
	(0.027)	(0.027)	(0.026)	(0.026)
Math test score 8th G	-0.012	-0.006	0.002	0.008
	(0.002)	(0.002)	(0.002)	(0.003)
Teacher experience	0.003	-0.001	0.003	0.001
	(0.002)	(0.003)	(0.003)	(0.003)
1/(prop class time teacher	-0.036	-0.088	-0.053	-0.050
spends maintain. order)	(0.093)	(0.094)	(0.095)	(0.099)

Note: all specifications control for family income, parents' education, race, sex, number of siblings, single parent and geographical region. Standard errors in parenthesis

Table 10: First stage estimates

	Help with hw	Check hw	Material studied in class	Course selection
Math test score 8th G	-0.007	-0.007	-0.007	-0.007
	(0.001)	(0.001)	(0.001)	(0.001)
Use of illegal drugs at school	-0.074	-0.070	-0.071	-0.072
	(0.034)	(0.039)	(0.035)	(0.036)
Skipping school	0.027	0.032	0.033	0.033
	(0.022)	(0.022)	(0.021)	(0.021)
Physical injury to students	0.035	0.026	0.028	0.023
	(0.029)	(0.032)	(0.030)	(0.032)
Use of alcohol at school	0.016	-0.005	-0.001	0.001
	(0.035)	(0.046)	(0.036)	(0.037)
Verbal abuse of teachers	0.031	0.022	0.028	0.018
	(0.022)	(0.026)	(0.023)	(0.026)
Physical abuse of teachers	0.007	-0.003	0.002	-0.007
	(0.023)	(0.025)	(0.023)	(0.025)
Robbery or theft	0.010	0.008	0.001	0.007
	(0.026)	(0.028)	(0.027)	(0.027)

Note: all specifications control for family income, parents' education, race, sex, number of siblings, single parent and geographical region. Standard errors in parenthesis

Table 11: IV estimates for parental involvement measures

	Help with hw	Check hw	Material studied in class	Course selection
Suspensions	0.702	-0.402	-0.662	-0.602
	(0.546)	(0.846)	(0.518)	(0.659)
Math test score 8th G	-0.005	-0.009	-0.001	0.005
	(0.007)	(0.006)	(0.005)	(0.007)
Teacher experience	0.003	0.002	0.003	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
1/(prop class time teacher	0.011	-0.093	-0.049	-0.128
spends maintain. order)	(0.103)	(0.111)	(0.104)	(0.107)

Note: all specifications control for family income, parents' education, race, sex, number of siblings, single parent and geographical region. Standard errors in parenthesis

Table 12: First difference estimates for parental involvement measures

	Material studied in class	Course selection
Suspensions	0.0230	-0.001
	(0.0419)	(0.012)
Change in lag math test score	0.001	-0.001
	(0.000)	(0.000)
Change in Family Income	-0.001	0.001
	(0.005)	(0.002)

Note: Standard errors in parenthesis

6 Appendix A: More Characteristics of NELS:88

NELS:88 is a nationally representative sample of eighth-graders that were first surveyed in the spring of 1988. The original sample employed a two-stage sampling design, selecting first a sample of schools and then a sample of students within these schools. In the first stage the sampling procedure set the probabilities of selection proportional to the estimated enrollment of eighth grade students. In the second stage 26 students were selected from each of those schools, 24 randomly and the other two were selected among hispanic and Asian Islander students, resulting in approximately 25,000 students. A sample of these respondents (18,221) were then resurveyed through four follow-ups in 1990, 1992, 1994, and 12,144 were interview again in 2000. Along with the student survey, NELS:88 included surveys of parents, teachers, and school administrators. By beginning with the 8th-grade, NELS:88 was able to capture the population of early dropouts—those who left school prior to spring term of 10th grade—as well as later dropouts (who left after spring of 10th grade). The study was designed not only to follow a cohort of students over time but also to "freshen" the sample at each of the first two follow-ups, and thus to follow multiple grade-defined cohorts over time. Thus, 10th grade and 12th grade cohorts were included in NELS:88 in the first follow-up (1990) and the second follow-up (1992), respectively. In late 1992 and early1993, high school transcripts were collected for sample members, and, in the fall of 2000 and early 2001, postsecondary transcripts were collected, further increasing the analytic potential of the data.

Next the characteristics of each of the data collection years are summarize (See National Center for Education Statistics (2002) for a complete description):

Base-Year Study. The base-year survey for NELS:88 was carried out during the 1988 spring semester. The study employed a clustered, stratified national probability sample of 1,052 public and private 8th-grade schools. Almost 25,000 students across

the United States participated in the base-year study. Questionnaires and cognitive tests were administered to each student in the NELS:88 base year. The student questionnaire covered school experiences, activities, attitudes, plans, selected background characteristics, and language proficiency. School principals completed a questionnaire about the school; two teachers of each student were asked to answer questions about the student, about themselves, and about their school; and one parent of each student was surveyed regarding family characteristics and student activities.

First Follow-up Study. Conducted in 1990, when most sample members were high school sophomores, the first follow-up included the same components as the base-year study, with the exception of the parent survey. The study frame included 19,363 in-school students, and 18,221 sample members responded. Importantly, the first follow-up study tracked base-year sample members who had dropped *out-of-school*, with 1,043 dropouts taking part in the study. Overall, the study included a total of 19,264 participating students and dropouts. In addition, 1,291 principals took part in the study, as did nearly 10,000 teachers.

Second Follow-up Study. The second follow-up took place early in 1992, when most sample members were in the second semester of their senior year. The study provided a culminating measurement of learning in the course of secondary school and also collected information that facilitated the investigation of the transition into the labor force and postsecondary education. The NELS:88 second follow-up resurveyed students who were identified as dropouts in 1990, and identified and surveyed additional students who had left school since the previous wave. For selected subsamples, data collection also included the sample member's parents, teachers, school administrators, and academic transcripts.

Third Follow-up Study (NELS:88/94). The NELS:88 third follow-up took place early in 1994. By this time in their educational careers, most of the sample

members had already graduated from high school, and many had begun postsecondary education or entered the workforce. The study addressed issues of employment and postsecondary access and was designed to allow continuing trend comparisons with other NCES longitudinal studies. The sample for this follow up was created by dividing the second follow-up sample in 18 groups based on their response history, dropout status, eligibility status, school sector type, race, test score, socioeconomic status and freshened status. Each group was assigned an overall selection probability. Cases within a group were selected such that the overall probability was met, and the probability of selection within the group was proportional to each sample member second follow-up weight. The final sample size was 15,875 individuals.

Fourth Follow-up Study (NELS:88/2000). The fourth follow-up to NELS:88 (NELS:88/2000) included interviews with 12,144 members of the three NELS:88 sample cohorts 12 years after the base-year data collection (For costs reasons the third follow-up sample was subsample to limit the numbers of poor and difficult respondents and those who were unlikely to be located (those who couldn't be located during earlier follow-up interviews). From here 15,649 individuals were selected and 12,144 of them completed the survey). Because these data represent the period 6 years after the last contact with the sample, they will enable researchers to explore a new set of educational and social issues about the NELS:88 respondents. For example, in 2000, most of the participants from the various cohorts of NELS:88 had been out of high school for 8 years and were 26 years old. At this age, the majority of students who intend to enroll in postsecondary schools will already have done so. Thus, a large proportion of students have completed college; some completed graduate programs. Many of these young people are successful in the market place, while others have had less smooth transitions into the labor force.