Boys Named Sue:
Disruptive Children and their Peers

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"Some gal would giggle and I'd get red/ And some guy'd laugh and I'd bust his head./
I tell ya, life ain't easy for a boy named Sue."
--"A Boy Named Sue", by Shel Silverstein, performed by Johnny Cash (1969)

In the 1999-2000 round of the Schools and Staffing Surveys conducted by the U.S. Department of Education, nearly half of all surveyed teachers in the United States reported that student misbehavior in their school interfered with their ability to teach effectively, and a similar fraction stated that student disrespect toward teachers is a "serious" or "moderate" problem in their school. Teachers expressed unhappiness with student misbehavior and disrespect at a higher rate than expressed concern with student apathy, students coming to school unprepared to learn, or lack of parental involvement. The typical teacher reported having to interrupt class more than twice per day to deal with student disruptions, and nearly one-fifth of teachers reported student disruptions that interrupted their teaching at least hourly. And one in five teachers argue that their principals do not enforce the rules of student conduct. Student disruption is correlated with low teacher morale: Teachers reporting disruption to be a problem in their school are more than three times as likely to say that they "definitely plan to leave teaching as soon as I can" and are one-third less likely to state that they will continue to teach "as long as I am able."

School administrators apparently agree with teachers about the perils of disruptive children in the classroom. Half of the schools in the Schools and Staffing Survey have programs for disruptive students, and 40 percent of teachers participate in annual professional development in classroom management and student discipline.

It is clear from the survey data that many teachers, school districts and states view classroom disruption as a significant problem that interferes with their jobs and, consequently, the education of the peers of disruptive children. Academic economists apparently agree: Lazear (2001) presents theoretical results suggesting that classroom disruption could strongly interfere with student outcomes, and can more than counteract any educational benefits accruing due to reduced class sizes.

Yet while the potential presence of peer effects in education has been studied extensively over the past decade, with a few prominent examples of recent papers including Angrist and Lang (2002), Evans, Oates and Schwab (1992), Hanushek, Kain and Rivkin (2002), Sacerdote (2000) and Zimmerman (2002), the question of whether disruptive children influence peer learning and behavior in school has gone unstudied. To date, the study that most closely addresses this question is Hoxby's (2000) analysis of the effects of additional male students in a classroom on student outcomes, the argument being that male students are more likely to disrupt the learning environment than are female students. And Gaviria and Raphael (2001) investigate whether school-level peer effects lead to juvenile delinquency and other behaviors, but do not consider whether delinquent behavior spills over to peer academic performance. One explanation for the lack of research on the effects of disruptive children on their classmates involves data; there exist few opportunities to link disruptive children to their classmates in the existing datasets. But it is also the case that it is particularly difficult to disentangle the effects of disruptive children from non-random selection; if low-performing students are more likely to

misbehave, and children are either grouped by ability within a school or otherwise self-select into classrooms by ability, then any finding of an effect of disruptive children on peer performance or behavior could be spurious.

I propose an unusual identification strategy to estimate the effects of disruptive students on peer behavior and academic outcomes. I suggest that boys with names most commonly given to girls may be more prone to misbehavior as they get older. The argument goes as follows: Up until a certain point in childhood, boys with names associated with girls are unaffected by their names, either positively or negatively. But as they enter middle school and (1) become more aware of their own sexuality and (2) are mixed with a new group of children (including those older than they are) who did not attend their elementary school, boys with names associated with girls may begin to misbehave in school at a disproportionate rate. The data bear this out: In the large Florida school district that provided me with the data for this analysis, in elementary school there is no relationship between names and boys' behavior, but in sixth grade, the first year of middle school, a large gap emerges in behavior between boys with names associated with girls and other boys. I therefore propose boys' names as an instrument for misbehavior in sixth grade; given that behavior problem differentials did not exist prior to sixth grade, there is no reason to suspect non-random selection into classrooms by boys with names associated with girls. However, the evidence described in this paragraph (and presented in more detail below) suggests that boys' names may have substantial first-stage explanatory power.

I utilize data on names, classroom assignment, behavior problems and student test scores from a large Florida school district in the school years spanning 1996-97 through 1999-2000. Because I know which classes each child takes from the child's academic history transcript, I can identify the child's peer group in each year. Since I have access to discipline records, I can proxy for misbehavior using student suspension data. While this is not a perfect measure of classroom disruption, it seems a reasonable proxy, and is supported by my own classroom observation and interviews with teachers and school personnel. And I can measure student test scores in grades three through six on a nationally norm-referenced examination. I find that, as suggested above, boys with female-sounding names tend to misbehave disproportionately in sixth grade, as compared to other boys and to their previous (relative) behavior patterns. In addition, I find that behavior problems, instrumented with the distribution of boys' names in the class, are associated with increased peer disciplinary problems and reduced peer test scores, indicating that disruptive behavior of students has negative ramifications for their peers.

Boys named Sue?

I adopt an agnostic approach to measuring the "femininity" of a boys' name. I consider a boy's name to be associated with girls if it is empirically observed to be given to girls more frequently than boys. Just under two percent of boys have names that are more frequently given to girls than to boys, suggesting that a child will share a class with a boy with a feminine name in about one of three classes. Among the boys' names given overwhelmingly to girls, the most commonly given in the state of Florida between 1989

and 1994[1] are, in order, Alexis (given 90 percent of the time to girls), Courtney (94 percent), Shannon (92 percent), Kelly (93 percent), Shelby (95 percent) and Ashley (99 percent). Among names given more frequently to girls than to boys, the most common names are Taylor (71 percent female), Dominique (66 percent), Alexis (90 percent), Jamie (81 percent), Ariel (80 percent) and Courtney (94 percent). These names are all reasonably common; the name Taylor is observed among boys at the same rate as Derek, Nathan and Paul, while the name Dominique is observed among boys at the same rate as Darrell, Lucas or Max. These names are, however, much more popular for girls, with Taylor appearing as frequently as Elizabeth, Emily and Megan and Dominique appearing as frequently as Catherine, Julia and Paige. Historically, many of these names were not as sex-linked as they are today: For instance, in the 1990 Census's lists of American name popularity, regardless of age, males are named Taylor at twice the rate of females, and males and females are named Ariel at about the same rates.

Figure 1 plots the likelihood that a child will be suspended for at least five days on at least one occasion, by grade, sex, and, for boys, the gender-orientation of the name, for children in the unnamed school district between 1996-97 and 1999-2000. One observes that, across the board, few children get into serious trouble in third or fourth grade, but that in fifth grade the rate of serious trouble increases considerably, and this rate continues to increase in sixth grade. The bottom line in the figure is for girls; unsurprisingly, girls are less likely to get into serious trouble than are boys, regardless of grade. The next two lines represent the serious disciplinary rate of boys. It is clear that boys with feminine names track the rest of the male population almost perfectly through

[1] These figures come from birth vital records data provided by the Florida Department of Health.

fifth grade, but in sixth grade boys with feminine names are about one-third more likely than boys in general to get into serious trouble. The top two lines perform the same analysis for African-American boys. As with boys in general, African-American boys with feminine names follow almost identical disciplinary paths on average as do African-American boys in general. But again in sixth grade, these two groups begin to differ dramatically, with African-American boys with feminine names around one-third more likely than African-American boys in general to get into serious trouble in school. Indeed, the general pattern observed for boys is driven by African-American boys; White boys with feminine names continue to track the population of White boys in general. This general pattern supports the notion that the gender orientation of names could be used to explain behavior problems in school.

As Table 1 shows, there is no apparent relationship between a student's ability level and his or her likelihood of sharing a class with a boy with a feminine name. The numbers reported in this table are the fractions of the male peers with feminine names for children of different measured ability types. This table shows that the likelihood that a child across the ability spectrum (as measured by third grade mathematics test scores) will have a male classmate with a feminine name is approximately equal in third grade, and remains uniform through grades four through six. In grade six, the fraction of male classmates with feminine names falls for all student groups because sixth graders tend to have a larger number of peers by virtue of the fact that they take multiple classes, often with different classmates. The fact that my instrumental variable does not vary across

ability groups, either in cross-section or over time, increases the credibility of its use as an instrument in the present context.

Likewise, the evidence suggests that boys with feminine names tend to have similar elementary school achievement levels to boys with more masculine names. In elementary school, African-American boys with feminine names averaged in the 42nd national percentile in mathematics, while African-American boys with names typically given to boys averaged in the 40th national percentile. White boys with feminine names averaged in the 74th national percentile in mathematics, while white boys with names typically given to boys averaged in the 73rd national percentile. Therefore, in elementary school, boys with feminine names look extremely similar to boys with more masculine names in terms of key observables.

First stage estimates of the relationship between gender orientation of names and discipline problems

I estimate the effects of disruptive children on their peer outcomes using a simple instrumental variables specification, in which the second stage is represented by

$$(\text{Outcome})_{icg} = \alpha_i + \theta_g + \gamma(\text{Observable peer attributes})_{icg} + \beta(\text{Rate of disruptive behavior among peers})_{icg}$$

for student i in classroom group c in grade g. I control for three main observable peer attributes—the fraction African-American in the student's classroom, the fraction males among the student's classmates, and the average third grade mathematics test score of the

student's current peers.[2] The coefficient β is my key parameter of interest, but the rate of disruptive behavior among peers, proxied here by the fraction of the class that has been suspended for at least five days, is likely to be endogenous. I therefore instrument for this variable using the fraction of boys in the classroom with feminine names, and this fraction interacted with a dummy variable for the sixth grade.[3]

The first column of Table 2 presents estimates of the first stage of this instrumental variables regression. One observes no evidence of a differential rate of suspensions among boys prior to grade six, but in sixth grade this gap widens considerably (as evidenced by the large, statistical coefficient on the interaction term). The other coefficient estimates in the first stage regression are unsurprising: Classrooms with more African-American or male students have more disciplinary problems in general, as do classes with lower average third-grade test scores, my proxy for initial ability levels.

The second column of Table 2 presents an augmented first stage estimate, in which I estimate separate effects of the rate of African-American boys with feminine names and this variable's interaction with a sixth grade dummy variable. One observes that the first-stage results are clearly due to African-American boys, rather than boys in general. These results empirically support the supposition made earlier that children with male peers with feminine names are also likely to experience greater rates of disciplinary

[2] In the cases in which a student has multiple classes, I average the student's class attributes together. The results are not sensitive to taking simple averages of the classes or weighted averages of the classes based on student enrollment in each class.

[3] I also estimate models in which I identify the effects of disruptive peers solely using this interaction, and the "main effect" of the fraction of boys in the classroom with "feminine" names is included in both the first and second stages.

problems in their classroom, particularly if their male classmates with feminine names tend to be African-American. The names of a child's peers has strong independent explanatory power in predicting the likelihood that that child's peers will get into trouble in school, with the partial r-squared associated with names equaling 0.03 in the model that does not distinguish between African-American boys with feminine names and other boys with feminine names, and 0.08 in the model that makes this distinction.

Instrumental Variables Regression Results

Table 3 presents the second-stage results of the instrumental variables model described above. Each column represents two different dependent variables: (1) the propensity of a given child to him- or herself be suspended at least once for at least five days, and (2) the national percentile ranking of that child's mathematics score on a nationally norm-referenced test such as the Iowa Test of Basic Skills or the Stanford Achievement Test-8.[4] In each model, I control for student fixed effects, grade dummies, and controls for classmate attributes (the fraction African-American in a class, the fraction male in a class, and the average third-grade test score of a student's classmates.) Each of the four columns in Table 3 represents a different combination of instruments employed and main effects controlled for.

Specification 3 in Table 3 presents the results of the model in which I use both the fraction of male classmates with feminine names and its interaction with sixth grade as instruments for the fraction of students who are disruptive. The coefficient estimates, taken literally, would represent the estimated effects of moving from zero percent to 100

[4] I cannot reveal the precise examination because it may identify the school district.

percent of the student's classmates being disruptive, so are not directly interpretable. To put these estimates in perspective, in a typical classroom of 30 students, the estimates suggest that adding one additional disruptive child to the classroom results in reduced peer mathematics test scores of 2.2 national percentiles and a 3.2 percentage point increased likelihood that a peer will him- or herself get into serious trouble at school, as measured by being suspended at least once for five or more days. These estimated effects are substantial in magnitude as well as being statistically significant.

In model specifications not presented in the paper but available on request, I experimented with models that treated the relationship between the fraction of disruptive children in the classroom and the peer outcomes as nonlinear. However, I could find no evidence that this relationship is either quadratic or reflects some type of "tipping" model, and instead, all models indicated that the relationship, at least through sixth grade, is linear. It may be the case that in higher grades where the rate of disruptive behavior may potentially be even greater, the relationship is nonlinear, but at least through sixth grade this does not appear to be the case.

Specification 4 in Table 3 reports the results of the same basic identification strategy, but this time I control for the fraction of male classmates with feminine names, identifying the instrumental variables model only off of the interaction with sixth grade. The estimated effects of disruptive children on their peers' outcomes are nearly identical, with the coefficient estimates indicating that adding one more disruptive student to a classroom is associated with 2.2 national percentiles lower peer mathematics

performance and 2.9 percentage points increased likelihood of peers getting into trouble themselves.

Specifications 5 and 6 in Table 3 use as instruments both the fraction of all boys in the class with feminine names and the fraction of African-American boys in the class with feminine names, given that the first stage appears to be driven mainly by African-American boys, rather than all boys. Specification 5 includes the main effects of these variables as instruments, while Specification 6 controls for them in both the first and second stage, and identifies the instrumental variables model off of the interaction terms with sixth grade. As before, the results are large and statistically significant, and comparable in magnitude to those reported above (with the math score results somewhat larger): Adding one more disruptive child to the classroom is estimated to lead to 2.7 to 4.0 national percentiles lower peer mathematics performance and 2.9 to 3.3 percentage points increased likelihood that peers will be suspended at least once for five or more days.

Sex differences in outcomes

It is reasonable to expect that disruptive classmates may have differential impacts on their peers depending on the sex of the peer. For example, a disruptive classmate that inhibits teacher instruction and peer concentration would likely lead to similar learning problems for male and female peers, while this same disruptive classmate's behavior may not have similar behavioral effects on peers. Specifically, since boys are more prone to behavioral problems in school than are girls, I would expect that the presence of a disruptive

classmate would have a larger effect on male peers' behavioral outcomes than on female peers' behavioral outcomes. In Table 4 I repeat the instrumental variables models separately for boys and girls. For simplicity, this is the model reported in Specification 6 of Table 3, in which I identify the instrumental variables model exclusively off of the interactions between sixth grade and both the fraction of male classmates with feminine names and the fraction of African-American male classmates with feminine names. All other control variables (student fixed effects, grade dummies, peer characteristics, the fraction of male classmates with feminine names and the fraction of African-American male classmates with feminine names) are included in both the first and second stages.

One observes that the first stage coefficients on the instrumental variables are remarkably similar for both boys and girls, which is reassuring because this first stage should not differ across these two groups. However, the second stage coefficients on the fraction of disruptive classmates do differ by sex in the expected manner. Adding one more disruptive classmate to a classroom is associated with 3.97 national percentiles lower mathematics test scores for male peers and 4.03 national percentiles lower mathematics test scores for female peers. But while adding one more disruptive classmate to a classroom is estimated to increase the likelihood of male peer misbehavior by 3.9 percentage points, it is estimated the likelihood of female peer misbehavior by a (still substantial, but smaller) 2.5 percentage points.

Conclusion

This paper presents the first empirical evidence of the effects of disruptive classmates on their peers' performance. I find that disruptive classmates apparently reduce overall mathematics achievement and increase the likelihood that other classmates will become disruptive and experience behavioral problems as well. The results indicate that boys and girls alike suffer academically from the presence of disruptive classmates, and that boys are particularly prone to misbehave when their classmates are disruptive.

These results suggest that children in classrooms with more disruptive children may require additional remediation, perhaps via smaller class sizes or more experienced teachers. I do not have information on teacher experience in my dataset, and class sizes in this school district do not vary appreciably within a grade level in a school, so I cannot directly test for whether these remedies would offset the negative effects of classroom disruption, but I intend to pursue these questions in future work.

The results also suggest a potential role for early prevention of disruptive children. I have identified a boy's name as a possible early-warning flag of disruptive behavior in middle school, and there are surely other pre-indicators of classroom disruption that I have not uncovered. It may be beneficial for schools to seek to determine the variables that predict future classroom disruption and either schedule classes with this in mind or actively seek to remediate potentially disruptive children before they become so. It is not obvious how to do this, but understanding the precursors to classroom disruption may help states and school districts to develop more effective classroom disruption prevention

programs, the outcomes of which could—given the results presented in this paper—bear substantial fruit.

References

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Figure 1: Percentage of children suspended 5+ days on at least one occasion

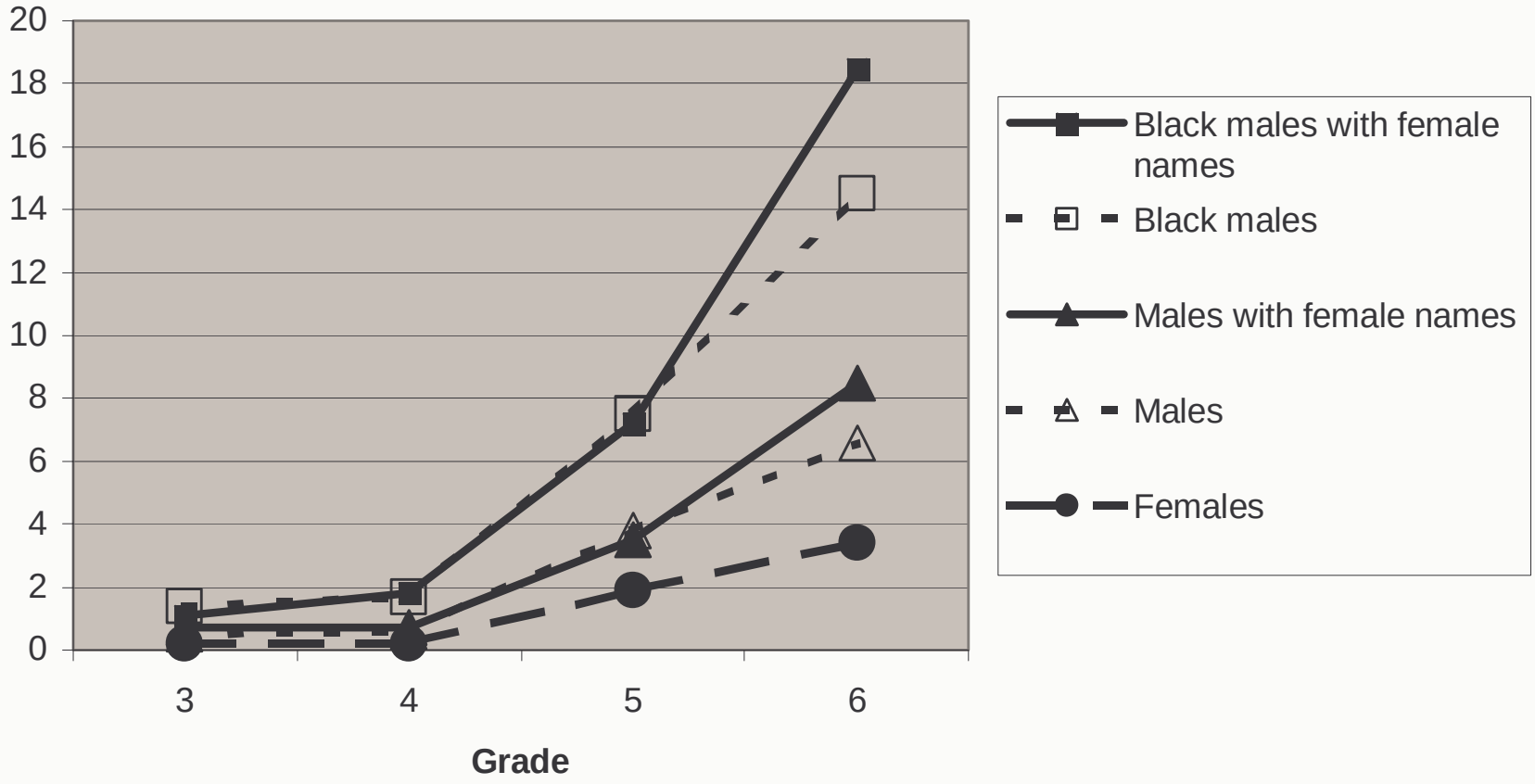

Table 1
Fraction of male classmates with feminine names, by student type and grade

Student type	Grade			
	3	4	5	6
Bottom quartile of third grade math test distribution	0.018	0.017	0.017	0.012
Second quartile	0.017	0.015	0.015	0.013
Third quartile	0.016	0.016	0.014	0.012
Top quartile	0.016	0.017	0.015	0.013

Table 2
First-stage estimates of the relationship between boys with female names and the rate of classroom disruption faced by students

Dependent variable: Fraction of classmates suspended at least once for 5+ days

	Specification	
	(1)	(2)
Child fixed effects	YES	YES
Grade dummies	YES	YES
Fraction of male classmates with female names	0.003 (0.013)	0.009 (0.011)
Fraction of African-American male classmates with female names		0.035 (0.026)
Fraction of male classmates with female names x grade 6	0.226 (0.040)	-0.273 (0.026)
Fraction of African-American male classmates with female names x grade 6		1.065 (0.066)
Average third grade national percentile ranking of classmates (coefficient x 10)	-0.003 (0.000)	-0.003 (0.000)
Fraction of classmates who are African-American	0.043 (0.002)	0.040 (0.002)
Fraction of classmates who are male	0.042 (0.004)	0.039 (0.004)
Partial r-squared of female names variables	0.03	0.08

Notes: Standard errors adjusted for clustering are in parentheses beneath coefficient estimates. Data are for students in grades three through six.

Table 3
Instrumental variables estimates of
the effect of disruptive classmates on student outcomes

	Specification			
	(3)	(4)	(5)	(6)
Child fixed effects	YES	YES	YES	YES
Grade dummies	YES	YES	YES	YES
Controls for fraction Black, third grade scores, fraction males among classmates	YES	YES	YES	YES
Controls for fraction of male classmates with female names	NO	YES	NO	YES
Controls for fraction of Black male classmates with female names	NO	NO	NO	YES
Instruments employed	Fraction male classmates with female names (F), F x grade 6	Fraction male classmates with female names x grade 6	Fraction male classmates with female names (F), Fraction Black male classmates with female names (BF), F x grade 6, BF x grade 6	Fraction male classmates with female names x grade 6, Fraction Black male classmates with female names x grade 6
DEPENDENT VARIABLE	IV COEFFICIENT ESTIMATE ON FRACTION OF CLASSMATES SUSPENDED AT LEAST ONCE FOR 5+ DAYS			
Mathematics test score (national percentile ranking)	-67.11 (25.49)	-65.68 (47.50)	-80.89 (29.18)	-119.81 (17.93)
Child suspended at least once for 5+ days	0.95 (0.28)	0.86 (0.53)	0.87 (0.35)	1.00 (0.20)

Notes: Standard errors adjusted for clustering are in parentheses beneath coefficient estimates. Data are for students in grades three through six.

Table 4
Sex differences in instrumental variables estimates of
the effect of disruptive classmates on student outcomes

	Males	Females
First stage coefficient on fraction of male classmates with female names x grade 6	-0.291 (0.043)	-0.266 (0.030)
First stage coefficient on fraction of African-American male classmates with female names x grade 6	1.091 (0.110)	1.045 (0.073)
DEPENDENT VARIABLE	IV COEFFICIENT ESTIMATE ON FRACTION OF CLASSMATES SUSPENDED AT LEAST ONCE FOR 5+ DAYS	
Mathematics test score (national percentile ranking)	-119.00 (29.03)	-120.79 (20.70)
Child suspended at least once for 5+ days	1.178 (0.320)	0.769 (0.241)

Notes: Regressions are estimated separately for males and females. Standard errors adjusted for clustering are in parentheses beneath coefficient estimates. Data are for students in grades three through six.