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Zero Benefit: Estimating the Effect of Zero Tolerance Discipline Polices on Racial Disparities in School Discipline

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Abstract

This study estimates the effect of zero tolerance disciplinary policies on racial disparities in school discipline in an urban district. Capitalizing on a natural experiment, the abrupt expansion of zero tolerance discipline policies in a mid-sized urban school district, the study demonstrates that Black students in the district were disproportionately affected, with an additional 70 Black students per year recommended for expulsion following the policy change. Furthermore, the study uses negative binomial regression discontinuity analysis to explore the effect of expanding zero tolerance on the proportion of days students are suspended. Following the policy change, the already sizeable difference in the proportion of days suspended between Black students and White students increased.

Keywords

educational policy, secondary education, school districts, zero tolerance, school discipline

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Disproportionate school disciplinary outcomes for students of color, particularly Black students, are pervasive in the United States, and the evidence of these disparities is overwhelming and well documented (Gregory, Skiba, & Noguera, 2010; McCarthy & Hoge, 1987; Nichols, 2004; Raffaele Mendez & Knoff, 2003; Skiba, Michael, Nardo, & Peterson, 2002; Townsend, 2000). While the persistent American "achievement gap" between Black and White students on myriad measures of academic achievement commands the focus of educators, policymakers, and researchers, enormous inequalities in school discipline between Black students and White students—a discipline gap—receive less policy attention. Recently however, more attention has been paid in the popular press about racial disparities in school discipline, and on the related "school to prison pipeline." *Education Week* reported in 2010 that the federal government is investigating differences in disciplinary outcomes between White students and students of color, including the harshness of punishment and the disproportionate impact of "zero tolerance" disciplinary policies (Zehr, 2010). The recent killing of a Black Florida teenager by a neighborhood watch volunteer also highlighted zero tolerance discipline policies, as the teenager was serving an extended suspension from school when he was shot.

Zero tolerance disciplinary policies warrant particular scrutiny, both because of the disparate impact on students of color, and because of questions regarding their effectiveness. An American Psychological Association (APA) Zero Tolerance Task Force recently concluded that the implementation of zero tolerance policies in the late 1990's and early 2000's did not improve school climate or school safety, and it may have exacerbated the discipline gap between White students and students of color (American Psychological Association, 2008). Asserting that "the time is right to end zero tolerance," LaMarche (2011) wrote in *Education Week* that zero tolerance policies have led to suspension and expulsion rates at crisis proportions, denying students access to vital services, while failing to improve student behavior. The present study aims to examine specific evidence about the effects of expanding zero tolerance discipline policy on school suspension and expulsion rates for both Black students and White students.

Background and Context

Racial disparities in school discipline in U.S. schools have been documented and analyzed in scholarly articles for decades. McCarthy and Hoge (1987) reviewed literature from the 1960's through the 1980's that documented Black students being suspended from school or otherwise disciplined at rates

more than three times that of White students. In their investigation of a mid-Atlantic city in the 1970's, they concluded that significant disparities in punishment were not reasonably explained by differences in student misbehavior, and they noted a high degree of subjectivity among school authorities in decisions about school discipline. Bowditch (1993) described how school suspensions for Black students were seemingly disproportionate to the nature of the violations, and that school staff frequently used student transfers or the involuntary dropping of Black students as disciplinary tools. Raffaele Mendez and Knoff (2003) noted that out-of-school suspensions in the United States increased during the 1990's, and that 7th, 8th, and 9th grade students, particularly minority students, were most frequently suspended. They reported that Black students in the 1990's were suspended, on average, approximately 2.3 times more often than White students, although they noted some school districts where the suspension rate for Black students was as high as 22 times the rate for White students. Gregory and Mosely (2004) studied racial disparities in achievement and discipline at a large, diverse, urban high school, documenting a discipline gap for both within-school sanctions and suspension, documenting that both Black students represented approximately 37% of the student population but accounted for 80% of students sent to On-Campus Suspension and 68% of out of school suspensions.

Recent data from the National Center for Educational Statistics (NCES) indicated that racial disparities in school discipline have persisted and are arguably worsening during the last decade. School suspension and expulsion continue to be common forms of punishment in American schools. More than 3.3 million American students were suspended and over 102,000 were expelled from school in 2006[1] (NCES, 2009). Furthermore, the racial/ethnic distribution of these suspensions and expulsions reveal stark disparities; 15% of Black students, 6.8% of Hispanic students, 4.8% of White students, and 2.7% of Asian students were suspended from school. Using the Parent and Family Involvement in Education Survey in 1999, 2003, and 2007, the NCES (2012) estimated that the percentage of Black public school high school students who had ever been suspended rose from 37% in 1999 to 49% in 2007, compared to the slight decline in the rate for White students, from 18.2% in 1999 to 17.7% in 2007. Similarly, the estimated percentage of Black students who had ever been expelled from school rose from 6.5% in 1999 to 10.3% in 2007, while the rate for White students dropped from 1.8% in 1999 to 1.1% in 2007 (National Center for Educational Statistics, 2012, p. 38).

This widening of the discipline gap occurred during a period of significant expansion of zero tolerance discipline policies. Zero tolerance policies are "defined as a school or district policy that mandates predetermined

consequence/s or punishments for specific offenses" (U.S. Department of Education, 1998, p. 18). Federal influence on school discipline policy and zero tolerance policies in particular originated with the Gun-Free Schools Act of 1994, which directed states to pass legislation mandating the automatic expulsion of students from public schools for possessing a weapon (Sughrue, 2003). However in many schools, the concept of zero tolerance has since evolved to include the automatic suspension or expulsion of students for an expanded list of offenses, including alcohol and drug violations, physical assault and fighting, criminal damage to property, and committing multiple violations in the same school year (a closely related "three-strikes" disciplinary policy).

Researchers and advocates who express concern about zero tolerance disciplinary policies acknowledge that school safety and the protection of students and staff from violence and illegal drugs is vital but question the effectiveness and fairness of such policies (Skiba & Rausch, 2006; Sughrue, 2003). While a get-tough attitude about school discipline may seem like a sensible approach, Skiba and Rausch (2006) reported that zero tolerance discipline policies are associated with poorer school climate, lower student achievement, higher drop-out rates, and that increased reliance on suspension and expulsion for maintaining school climate and safety is likely to exacerbate racial disparities already present between Black and White students.

In 2005, the APA commissioned a task force to explore the impact of zero tolerance discipline policies in elementary and secondary schools. While acknowledging that safe and disciplined schools are a vital policy goal, the Task Force found little evidence to support the basic assumptions of a zero tolerance approach: That the certainty and seriousness of punishment will have a deterrent effect on students; that removing severely disruptive students will deter other students from behaving in a similar manner; and that removing offenders will improve school climate. Instead, the Task Force concluded that the available evidence tended to indicate that suspending students predicts more future misbehavior and that schools with higher rates of suspension and expulsion have poorer climate (American Psychological Association, 2008).

As to the impact of zero tolerance policies specifically on the discipline gap, the APA Task Force notes that by decreasing the subjectivity of decision making regarding discipline, perhaps such policies would reduce some bias and be fairer to students who traditionally have been subjected to harsher discipline (American Psychological Association, 2008). However, critical race theorists in education (e.g., DeCuir & Dixson, 2004; Gillborn, 2005; Ladson-Billings, 1998) argued against the notion that policies can be racially neutral in our present school system, noting that policies and practices

privilege White students while casting Black students as deficient and in need of "fixing." Gillborn (2005) noted how policy makers mistakenly envision education policy as consistently making at least incremental progress, and they frequently assume that a new policy (like zero tolerance) is naturally an improvement that can escape the racism of previous policies. Yet, as DeCuir and Dixson (2004) noted, decreased subjectivity and notions of colorblind policies fail to consider persistent racism and how policies that privilege White students might interact with a policy like zero tolerance. As Casella (2003) argued, "punishment negatively affects those who are already negatively affected by poverty, racism, academic failure, and other realities" (p. 879). What appears to be "neutral" policy that reduces some subjectivity of interpretation by school authorities might still be associated with increased racial disparities in discipline outcomes.

Despite the attention and alarm raised during the several decades about the discipline gap, racial disparities in school suspension and expulsion worsened considerably between 1999 and 2007 (NCES, 2012), and this phenomenon roughly coincided with the expansion of zero tolerance discipline policies in various states and districts. The APA Zero Tolerance Task Force specifically called for researchers to "conduct systematic efficacy research including quasi-experimental and randomized designs to compare outcomes of programs with and without zero tolerance policies and practices" (American Psychological Association, 2008, p. 859). The present study is a response to that call. Using a quasi-experimental design, this study exploits a school district policy discontinuity—the abrupt expansion of zero tolerance discipline policy in a mid-sized urban school district (here-to-for referred to as the "District")—to estimate the causal impact of zero tolerance discipline policies on racial disparities in disciplinary outcomes.

Research Questions and Hypotheses

This study estimates the effect of the expansion of this zero tolerance discipline policy on two different discipline outcomes: Racial differences in the percentage of students recommended for expulsion from the District; and racial differences in the proportion of days that all students in District secondary schools were suspended from school for any reason, including those students who were disciplined for less serious infractions. Beyond the effect of the change in disciplinary policy on the relatively small proportion of students who commit serious offenses and are recommended for expulsion, evidence about the effects of expanded zero tolerance on students who are *not* recommended for expulsion is also analyzed. If zero tolerance policies

have a deterrent effect for the larger population of students, and if an improved climate for learning is expected, then implementation may cause a decline in the incidents leading to school discipline—particularly school suspension. However, zero tolerance may also signal to school staff that they need to be more strict in assigning discipline to students *for all offenses*, not just those that are the most serious. And if zero tolerance discipline policies influence staff to administer harsher punishments in general, will this affect Black students and White students differently? Consequently, this analysis considers the following research questions:

1. Did expanding the zero tolerance disciplinary policy significantly widen racial disparities in the percentage of students recommended for expulsion?
2. Did expanding the zero tolerance disciplinary policy affect the proportion of days that Black students and White students were suspended from school?

It is hypothesized that the expansion of zero tolerance disciplinary policy exacerbated the already substantial disparities in expulsions and suspensions between Black students and White students. Defining a larger number of behavioral offenses as cause for recommending the expulsion of students would increase the number of students recommended, and that increase would disproportionately affect Black students. In addition, while some students may have altered their behavior in response to the advertised changes in discipline policy, it is hypothesized that overall suspension rates would increase, again disproportionately affecting Black students.

The rest of the article is organized as follows: The Methods section describes the site of the study, the details of the expansion of zero tolerance discipline policy, the two datasets, and the analytic method utilized; the Results section presents the findings from the two analyses, including graphical representations of the impact of the policy change; the Discussion and Conclusion outline the implications of this research for both the site district and for policymakers elsewhere.

Method

The site of the present study is a mid-sized urban school district serving more than 24,000 students. The District touts the high quality of its schools on the district website, noting that it well exceeds national and state averages for the rate that students pass Advanced Placement exams and the proportion of

students who are National Merit Scholars. It is also a diverse school district; 50% White, 24% Black, 15% Hispanic, and 10% Asian, and states in its mission statement a commitment to "embracing the full richness and diversity of our community." Unfortunately, as is all too common, the experience of students in schools differs significantly by race, particularly in who experiences school discipline and school removal. During the 2009-2010 school year, more than 33% of the District's approximately 3,000 Black secondary school students were suspended from school at least once, compared to 5% of the District's 6,500 White secondary school students—a racial disparity in the percentage of students suspended of more than 6 to 1.

A Natural Experiment

In September 2007, the District instituted a significant and unadvertised policy change regarding student discipline, substantially expanding the list of offenses subject to a zero tolerance mandate. This sharp discontinuity in school discipline policy provides an opportunity to study the causal effects of zero tolerance discipline on racial disparities in school discipline outcomes within the framework of a natural experiment. Initiated by the school board and school district administration, and introduced into the student code of conduct at the beginning of the 2007-2008 school year, this policy change mandated the use of an "aggravating factors analysis" by secondary school principals for serious violations of school rules. Many offenses that had previously been dealt with at the school level now required that principals suspend the student for five days and recommend the expulsion of that student to the superintendent of schools.

School districts typically expel students for very serious offenses, such as possession/use of a weapon, physical assault of staff, or selling illegal drugs at school. Like many other school districts, the District has codified that students who commit these serious offenses must be recommended for expulsion from school. Other serious offenses, like fighting, physical assault, property damage, and bomb threats have also been cause for suspension; and until September 2007 these offenses *may* have led to a recommendation for expulsion. Similarly, repeated serious violations of school rules also *may* have led to a recommendation for expulsion. However, beginning in September 2007, the Student Code of Conduct was changed, and principals were now *required* to recommend the expulsion of secondary students who commit a serious violation of school rules if one of several "aggravating factors" was determined to be present, including serious bodily injury, significant property damage, arrest for a Class A Misdemeanor or higher, and/or a significant loss of

instructional time. Furthermore, under the expanded zero tolerance policy principals are also required to recommend the expulsion of secondary students who committed three separate, serious violations within the same school year (fighting, stealing, and using alcohol, for example). This discipline policy applies to all District secondary students, which are defined as students in grades 6 through 12. In this analysis, the focus is on expulsion *recommendations*, as opposed to actual expulsions. The process of actually expelling a student from the District involves many layers of administrative process, an analysis of which would require access to private student data and the confidential records of expulsion hearings and closed Board of Education meetings. Such an analysis is beyond the scope of this article.[2]

My analysis of the minutes of Board of Education meetings in 2007 indicates that district-level administrators authored the "aggravating factors analysis" during the summer of 2007, in an attempt to bring consistency to the recommendation for expulsion process across the district. At the meeting in August 2007 where it was approved by the Board of Education, the policy was reviewed in detail. Nothing in the minutes indicates that the policy was a response to increased discipline infractions in school, or to any public discussion of school discipline. Nor is there evidence that other school districts in the area made any similar changes in discipline policy. The published minutes from a Board of Education meeting confirm that the policy change was an attempt to remove subjectivity, and possibly to reduce the number of expulsions. "Adding the aggravating factors removes all the discretion and objectifies the process. It will be far more consistent and may reduce the number of expulsions" (School Board Minutes). This abrupt expansion of zero tolerance disciplinary policy by the school board, beginning in September 2007 was unanticipated by school staff, students, and parents.

This policy change instituted by the Board of Education is the source of a natural experiment for estimating the causal impacts of zero tolerance discipline policy. By incorporating a discontinuity design, the secondary school students in the District are "assigned" into an exogenous "treatment." This results in a distinct division in which students fall either before or after the expansion of zero tolerance disciplinary policy. This exogenous "treatment" is common to all natural experiments within discontinuity design. Furthermore, by including schools outside of the District, this experiment allows for comparisons across similar districts that did not institute zero tolerance. Murnane & Willett (2011) indicate that providing an estimate of the treatment effect for the District, compared to what occurs in the neighboring districts, uses a difference-in-differences strategy. During the time period of the study, data about school suspensions in the District occurs 3 years before

the policy change, compared to 3 years of "treatment" subsequent to the expansion of zero tolerance discipline. At this same time, schools in surrounding districts provide an estimate of discipline policies that are unaltered by the similar policies. Thus, by using the data from the comparison districts and taking advantage of the naturally occurring experiment one can more clearly see the impact of the implementation of the zero tolerance policy in the District.

Recommendations for Expulsion

Two separate sources of data are available to address these research questions. The first dataset is a compilation of the number of students recommended for expulsion from the District from 2005-2006 through 2008-2009, disaggregated by race, as reported in the District's "Disciplinary Options Expulsion Data Summary." Students in this dataset were assigned to one of five race/ethnicity categories with which the student most identified: Asian (including Pacific Islander), Black (not Hispanic), Hispanic (all races), Native American (American Indian or Alaska Native) or White (not Hispanic). Combining this information with enrollment information available from the State Department of Education facilitates a calculation of the percentage of secondary students of each race/ethnicity recommended for expulsion in the two school years before the policy discontinuity and the two school years after the policy was implemented.

Proportion of Days Suspended

The second dataset is compiled from data available from the State Department of Education. School suspension rates, including the rates for the District reported at the beginning of this article, are often reported as percentages of students suspended in a given year. This analysis uses a less common measure, the proportion of days lost due to suspension, in order to capture both the overall rate of behavior leading to school suspension, as well as the response of school staff to the severity of the offenses committed.

The outcome variable of interest in this dataset is the proportion of possible school days students in each school are suspended, in the school years before and after the policy change. Proportion of days suspended is calculated by totaling the number of school days that students in a given school, of a given race, are suspended, and then dividing that number by the possible number of school days that students of a given race could attend school (e.g., 200 White students enrolled for the entire school year of 180 days = 36,000, which is the number of possible school days for White students). Converting

this proportion to a percentage allows for less cumbersome interpretations of this statistic. This variable is disaggregated by race for each school in each year, listing both the proportion of days that Black students are suspended from a school in a particular year, and also the proportion of days that White students are suspended from the school in the same year.[3] Values of this proportion range from zero, in three middle schools that suspended no students during one entire school year, up to 0.019 in a middle school where Black students were suspended for nearly 2% of possible school days—an average of more than 3 days of suspension for every Black student in the school that year. In addition, the time-varying percentage of economically disadvantaged students in each school was included for use as a covariate. Time is included as a continuous variable measured in school years and centered at the policy continuity. A dichotomous variable indicating whether the expanded zero tolerance policy is in effect serves as the predictor of interest.

The sample is comprised of 37 secondary schools; 15 District schools and 22 comparison schools. All of the traditional secondary schools in the District are included in the sample; 4 comprehensive high schools and 11 middle schools.[4] In order to provide evidence about secular trends in suspension rates during this time period for similar schools that were not subject to the policy change, 22 comparison schools from the area are included in the dataset. This sample of comparison schools from the same county as the District, as well as the secondary schools in a school district in the same athletic conference is comprised of 9 medium and large high schools, and the 13 middle schools that feed into them.[5] All of these schools operate under the same state laws as the District, but none of the school districts governing these comparison schools utilize a zero tolerance approach to discipline. No evidence of substantial discipline policy changes during the time frame under study was found.[6] Consequently, these schools serve as reasonable comparison schools to use in estimating trends in school suspensions for District schools by making adjustments in the secular trend of the causal estimate more precise.

The outcome of interest, the percentage of days students in a school are suspended, can be conceptualized as a count of events (suspension days) accumulated during a school year by students attending school for a known number of possible days. Analysis of proportions and counts using common regression techniques can be problematic. Count variables are necessarily discrete and positive, and the distributions of counts and proportions are frequently skewed. Thus, ordinary least squares regression assumption regarding the normal distribution of errors is not tenable, and the conditional mean structure should be constrained to be positive (Allison, 2009; DeMaris, 2004). One technique more appropriate for modeling count data is a negative

binomial regression model, which assumes that the event of interest (days of suspension from school) is a count resulting from an underlying continuous process, and that the rate of occurrence is governed by a negative binomial distribution (DeMaris, 2004). The negative binomial distribution is a probability distribution frequently used for modeling the probability of success or failure over a series of independent and identically distributed trials. In this particular case, each day of school that students are enrolled is modeled as a "trial," with days suspended modeled as "failures."[7]

For analyzing counts structured in panel data such as this dataset, Allison (2009) recommends estimating a negative binomial regression model using the *nbreg* command in Stata (StataCorp, 2011), including dummy variables for each school and correcting standard errors using the outer product of the gradient (opg) option. In this model, the number of days students are suspended is a function of the dichotomous main effect of whether the expanded zero tolerance policy is in force *(Zero Tolerance),* the dichotomous race indicator variable *(Black)*, the interaction of *Black* and *ZeroTolerance,* school year *(Year)*, the interaction of *Black* and *Year*, the time-varying percentage of economically disadvantaged students in the school *(Pct_Econ_Dis),* the number of possible attendance days for students of a particular race *(Possible_Days),* and school dummy variables as fixed effects. This regression formulation of the difference-in-differences strategy allows me to include a time-varying school-level covariate (Angrist & Pischke, 2009), and to include the data from both District schools and comparison schools in the calculation of the underlying secular trend of school suspensions. The first parameter of interest is the causal effect of expanding the zero tolerance discipline policy on the number of suspension days for White students. The second parameter of interest is the additional causal effect of expanding the zero tolerance discipline policy on the number of suspension days for Black students, beyond the effect for White students.

Results

The Proportion of Students Recommended for Expulsion

Did the expansion of the zero tolerance discipline policy increase the percentage of students recommended for expulsion? An examination of the descriptive statistics for expulsion recommendations during this time period reveals that the expanded zero tolerance policy did have that effect, and the effect on the population of Black students in the District is much greater than

Table 1. Number of Expulsion Recommendations, Secondary School Student Enrollment, and Percentage of Secondary School Students Recommended for Expulsion, by Race/Ethnicity, for the 2005-2006 through 2008-2009 School Years.

School year	Student race/ ethnicity	Number of expulsion recommendations	Number of secondary students	% students recommended for expulsion
Before expansion of Zero Tolerance Discipline Policy				
2005-2006	Asian	5	1,376	0.36
	Black	60	2,652	2.26
	Hispanic	12	1,303	0.92
	Native American	1	71	1.41
	White	27	8,718	0.31
	Total	*105*	*14,120*	*0.74*
2006-2007	Asian	3	1,362	0.22
	Black	59	2,802	2.11
	Hispanic	10	1,456	0.69
	Native American	0	90	0.00
	White	20	7,570	0.26
	Total	*92*	*13,280*	*0.69*
Following expansion of Zero Tolerance Discipline Policy				
2007-2008	Asian	4	1,315	0.30
	Black	133	2,888	4.61
	Hispanic	19	1,542	1.23
	Native American	3	88	3.41
	White	39	7,244	0.54
	Total	*198*	*13,077*	*1.51*
2008-2009	Asian	4	1,335	0.30
	Black	129	2,918	4.42
	Hispanic	13	1,568	0.83
	Native American	1	102	0.98
	White	35	6,867	0.51
	Total	*182*	*12,790*	*1.42*

the effect on students of any other race or ethnicity. Presented in Table 1 is a summary of the number of expulsion recommendations, the secondary school student enrollment, and the percentage of secondary school students

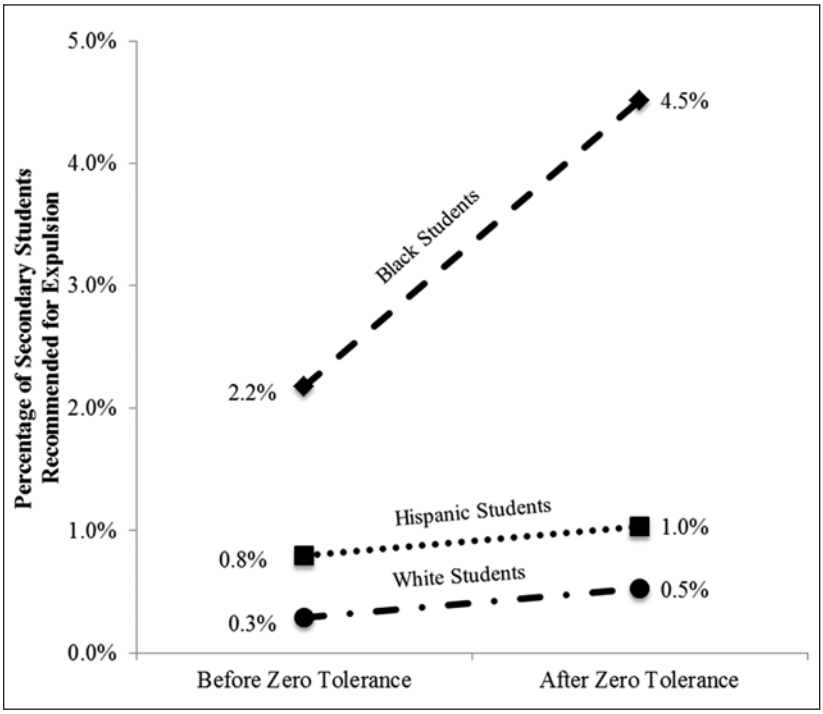

Figure 1. Percentage of Black, Hispanic, and White secondary students recommended for expulsion from the District during the two school years before (2005-2006 & 2006-2007) and the two school years after (2007-2008 & 2008-2009) the expansion of the zero tolerance discipline policy.

recommended for expulsion, by race/ethnicity, for the 2005-2006 through 2008-2009 School Years. A total of 197 secondary students were recommended for expulsion in the 2 years immediately before the expanded zero tolerance policy was implemented. This total nearly doubles to 380 students in the 2 years following the expansion of zero tolerance. The corresponding increase in the 2-year average of the percentage of students recommended for expulsion is from 0.72% to 1.47% of secondary school students.

The statistics presented in Table 1 are illustrated in Figure 1, which is a plot showing the percentage of Black, Hispanic, and White secondary students recommended for expulsion from the District during the two school years before and the two school years after the expansion of the zero tolerance discipline policy. The trend lines in Figure 1 provide a visual summary

of both the initial disparities in the rate of expulsion recommendations by race, as well as the substantial difference in the change of this rate following the expansion of the zero tolerance policy in the District beginning in the 2007-2008 school year. The percentage of White secondary students recommended for expulsion increased from 0.3% before the policy change to 0.5% after the policy change. For Hispanic students, the percent of students recommended for expulsion increased from 0.8% to 1.0% of secondary students. The already high percentage of Black secondary students recommended for expulsion from the District more than doubled from 2.2% to 4.5%.

The Proportion of Days Students in a School are Suspended

In Table 2, descriptive statistics for Dataset 2 are presented, which include the number and percentage of days Black student and White students were suspended, the number of possible days of attendance, the percentage of economically disadvantaged students, and school size, in the sample of 15 District secondary schools and 22 comparison secondary schools from the county and conference, during the 2004-2005 through 2009-2010 school years. During the time period under study, District middle schools ranged in size from 216 to 757 students, and District high schools ranged in size from 1,645 to 2,197 students. The percentage of days students were suspended from school in District schools averaged 0.78% for Black students and 0.11% for White students.[8] In the comparison non-District schools, middle schools ranged in size from 428 to 953 students, and non-District high schools ranged in size from 960 to 1,879 students. The percentage of days students were suspended in non-District schools averaged 0.71% for Black students and 0.10% for White students.

A visual summary of the percentage of days that schools in this study suspended Black students and White students is shown in Figure 2, a scatterplot displaying the percentage of days suspended, for Black students (solid) and White students (hollow), in District and non-District schools for the 3 years before and after the expansion of zero tolerance discipline. The approximately 7 to 1 ratio of the percentage of days suspended for Black students compared to White students is clearly demonstrated in this plot. This discipline gap is pervasive, and occurs in both District and non-District comparison schools during all 6 years of this study. In addition, while there are a few schools whose percentage of days suspended for Black students is lower than the percentage for White students in other schools, it is notable that this is never true within the same school. There are no schools in the study whose percentage of days suspended for Black students is lower than that for White students at that school. Also, there is no relationship between the racial

Table 2. Descriptive Statistics for Dataset 2: The Number of Days Suspended, the Number of Possible School Days, and the Percentage of Days Black Student and White Students Were Suspended; the Percentage of Economically Disadvantaged Students, and School Size, in the Sample of 15 District Secondary Schools and 22 Comparison Secondary Schools, During the 2004-2005 through 2009-2010 School Years ($n_{schools}$ = 37, n_{years} = 6).

Variable	Description	Mean	*SD*	Minimum	Maximum
Black students in District schools					
Days suspended	Number of days Black students in a school are suspended during year	265.5	245	6.5	1,129
Possible days	Number of possible days of attendance by all Black students in a school.	32,132	22,594	5,354	80,089
Percentage suspended	Percentage of days Black students in the school are suspended during year.	0.78%	0.39%	0.10%	1.83%
White students in District schools					
Days suspended	Number of days White students in a school are suspended during year	86.7	103.8	0	503
Possible days	Number of possible days of attendance by all White students in a school.	86,423	73,654	4,550	261,868
Percentage suspended	Percentage of days White students in the school are suspended during year.	0.11%	0.09%	0.00%	0.38%
District schools					
Percentage of economically disadvantaged	Percentage of students in a school who are economically disadvantaged	42.0%	16.2%	14.7%	85.1%
School size	Total number of students in a school during that school year	847	656	256	2,061
Black students in non-District comparison schools					
Days suspended	Number of days Black students in a school are suspended during year	72.2	62.5	0	324
Possible days	Number of possible days of attendance by all Black students in a school.	9,956	6,487	1,353	33,899

(continued)

Table 2. (continued)

Variable	Description	Mean	*SD*	Minimum	Maximum
Percentage suspended	Percentage of days Black students in the school are suspended during year.	0.71%	0.41%	0.00%	2.05%
White students in non-District comparison schools					
Days suspended	Number of days White students in a school are suspended during year	166.1	177	0	883
Possible days	Number of possible days of attendance by all White students in a school.	146,287	69,711	47,109	385,475
Percentage suspended	Percentage of days White students in the school are suspended during year.	0.10%	0.09%	0.00%	0.38%
Non-District comparison schools					
Percentage of economically disadvantaged	Percentage of students in a school who are economically disadvantaged	17.5%	10.8%	2.9%	54.3%
School size	Total number of students in a school during that school year	962	443	396	1,879

composition of schools and suspension rates. Schools with both low and high percentages of Black students, on average, suspend Black students for approximately 7 times as many days as White students.

Does expanding the zero tolerance disciplinary policy affect the percentage of days that students are suspended from school? The results of this analysis are mixed. The fitted percentage of days that White students were suspended from school policy was statistically unchanged under the expanded zero tolerance policy, compared to the 3 years before the policy change. However, the difference in the percentage between Black students and White students increased by approximately 30% of the White student percentage, on average, following the expansion of zero tolerance in September, 2008. The resulting parameter estimates, standard errors, and incident rate ratios from fitting a fixed-effects negative binomial regression model to this data are presented in Table 3. The model has good fit (likelihood ratio $\chi^2(43) =$

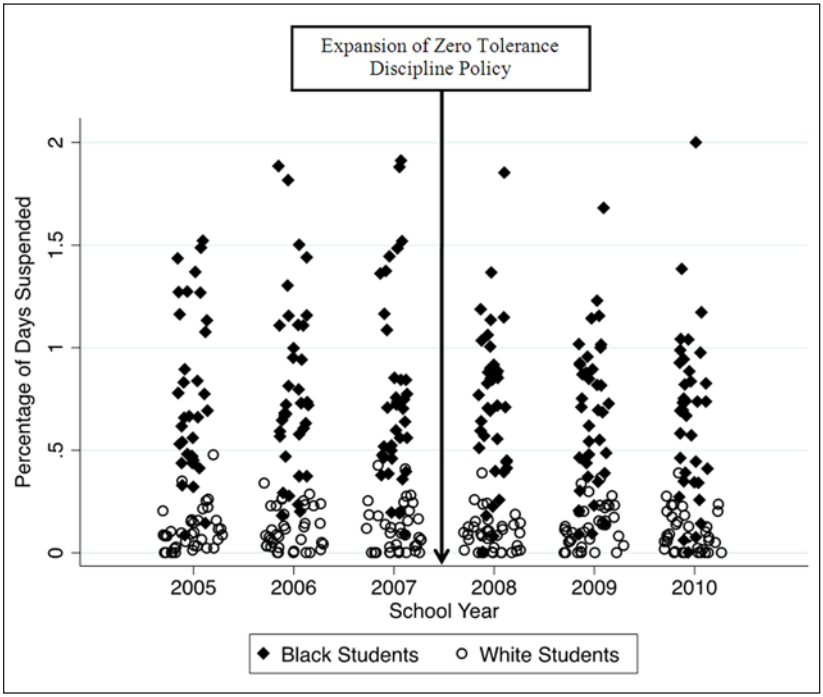

Figure 2. Scatterplot displaying the percentage of days suspended, for Black students (solid) and White students (hollow), in District and non-District schools for the 3 years before and after the expansion of zero tolerance discipline ($n_{schools}$ = 37, n_{years} = 6).

820.4, $p<.001$), and explains approximately 16% of the variability in the number of suspension days for Black students and White students for the schools in the study (pseudo $R^2 = 0.16$).

The incident rate ratios (IRR) in Table 3 are interpretable as the proportionate difference in the rate of suspension days associated with a 1-unit difference in the predictor variable. The expansion of the zero tolerance policy is associated with a 0.91 [95% CI: 0.73, 1.12] proportionate change in the number of days suspended for White students, controlling for all other variables (including the number of possible days of attendance). This parameter is nonsignificant, with a wide confidence interval. The "effect" of being a Black student, estimated by the IRR for the variable "*Black*" is 7.96 [95% CI: 7.08, 9.94], which means that the fitted number of suspension days associated

Table 3. Parameter Estimates With Approximate *p*-values, Standard Errors, and Incident Rate Ratios [with 95% Confidence Intervals] for a School Fixed-Effects Negative Binomial Regression of the Number of Days Students Were Suspended on the Expansion of Zero-Tolerance Discipline Policy, Black Race (White is Reference), Year (Centered at Discontinuity), their Interactions, and the Schools' Percentage of Economically Disadvantaged Students, with the Number of Possible School Days as the Exposure ($n_{schools}$ = 37, n_{years} = 6).

	Parameter estimate	(Standard error)	Incident rate ratio (IRR)
Zero tolerance	–0.099	0.11	0.91 [0.73, 1.12]
Black	2.074***	0.059	7.96 [7.08. 9.94]
Black X Zero tolerance	0.258*	0.131	1.30 [1.00, 1.67]
Year	–0.038	0.029	0.96 [0.91, 1.02]
Black X Year	–0.028	0.031	0.97 [0.91, 1.03]
Percentage of economically disadvantaged	0.012	0.009	1.01 [0.99, 1.03]
Intercept	–7.418	0.229	
ln(α)	–1.551	0.075	

Fit Statistics: Likelihood Ratio $\chi^2(43) = 820.4$, $p<.001$; Pseudo $R^2 = 0.16$.
*$p < .05$. ***$p < .001$.

with Black students is 7.96 times the rate for White students, controlling for other variables in the model. Furthermore, the differential effect of the expansion of zero tolerance for Black students, estimated by the parameter estimate for the interaction of "*Black*" and "*Zero Tolerance*" is also significant (p = 0.05), with an IRR of 1.30 [95% CI: 1.00, 1.67]. The total IRR for Black students, calculated as the exponent of the sum of the raw parameter estimates for "*Zero Tolerance*" and "*Black X Zero Tolerance*" is 0.17 ($\chi^2(1)$ = 2.11, p = 0.15), but this combination of parameters is nonsignificant.

In Figure 3, the causal effects of the expansion of the zero tolerance discipline policy are illustrated with a plot of the fitted percentage of days suspended versus school year for Black students and White students in a prototypical District school, holding constant the percentage of students who are economically disadvantaged at 2008 levels. For White students the proportion of days suspended remains virtually unchanged at approximately 0.1% of possible school days. However, for Black students, the expansion of the zero tolerance discipline policy increased the fitted percentage of days suspended from 0.8% of possible school days to 0.9% of possible school days—an increase in the predicted number of days Black students in the

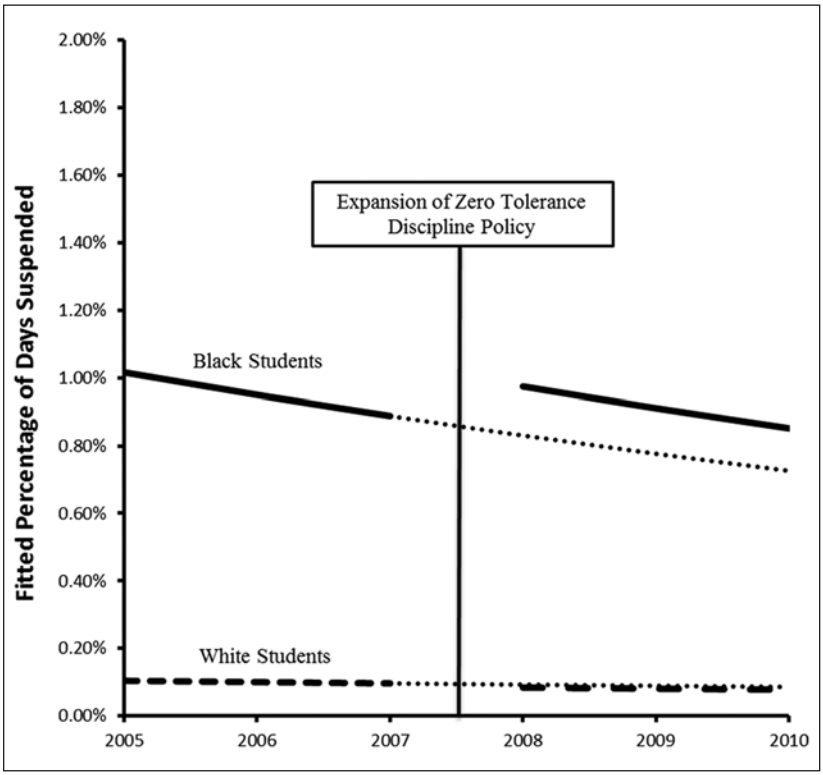

Figure 3. Plot of the fitted percentage of days suspended versus school year (where the year listed is the *end year* of the school year), for Black students and White students in a prototypical secondary school in the District, with the percentage of students who are economically disadvantaged held constant at 2008 levels; highlighting the effect of the expansion of zero tolerance discipline policy, and illustrating with dotted lines the estimated secular trend for District schools had they not been subject to the expansion of zero tolerance discipline policy (negative binomial regression with school fixed-effects, $n_{schools} = 37$, $n_{years} = 6$).

District were suspended from school of 0.25 days per Black secondary student, in the 2007-2008 school year, the first school year after the expansion of zero tolerance.

This analysis is robust to the size of the bandwidth around the policy discontinuity. Parameter estimates calculated using a 1-year and 2-year bandwidth are consistently in the same direction and are similar in magnitude.

Conducting separate analyses for Black students and for White students also produced estimates of the effect of expanding zero tolerance. Finally, limiting the analysis to District schools only and leaving out non-District comparison schools estimating the underlying secular trend also produced estimates of the effect of expanding zero tolerance that show Black student suspensions increasing following the policy change, while White student suspensions remained relatively unchanged or slightly decreased. The full model with a 3-year bandwidth, simultaneous modeling of Black students and White students, and the inclusion of comparison schools from the surrounding area is preferred, because it provides increased statistical power and evidence that the effects of the policy change last beyond one or two school years.

Discussion

The expansion of the zero tolerance discipline policy in the District at the beginning of the 2007-2008 school year led to a substantial increase in the percentage of Black secondary students being recommended for expulsion. This increase, from 2.2% of students before the policy change to 4.5% following the expansion of zero tolerance, resulted in the recommendation for expulsion of approximately 70 more Black students per year than would have been expected had the policy not been implemented. In addition, approximately 20 more students of other races/ethnicities were recommended for expulsion per year than would have been expected. Although less than a quarter of the secondary students in the District are Black, they comprise about three quarters of the increase in recommendations for expulsion under the expanded zero tolerance discipline policy. Clearly, racial disparities in rates of recommendation for expulsion are exacerbated under the expanded zero tolerance policy.

Did expanding zero tolerance affect the rest of the population of secondary students, perhaps by providing a deterrent effect, or by creating safer environments, more conducive to learning? Here again, this analysis demonstrates that expanding zero tolerance exacerbated already severe racial disparities in school disciplinary outcomes. While the estimated percentage of days that White students were suspended from school was virtually unaffected by the expansion of zero tolerance, holding nearly steady at approximately 0.1% of possible days of attendance, for Black students the expansion of zero tolerance caused an increase in the percentage of days suspended from of approximately 0.1 percentage points. This increase in the percentage of days suspended is approximately an additional 700 days of instruction lost to suspension for Black secondary students in the District during

the 2007-2008 school year. About half of this increase in additional days of suspension can be attributed to the estimated 70 Black students who were recommended for expulsion because of the expansion of zero tolerance, accounting for the additional 5 days of suspension that are part of this process. (No student is officially suspended from the District for more than 10 days for any one disciplinary incident, although students are frequently assigned to off-campus programming while the expulsion case proceeds.)

Other reasons for the increase in the predicted number of days of suspension of Black students are less obvious. One reason that zero tolerance policies are instituted in the first place is that they are thought to provide a deterrent effect, causing students to consider the possibility that they may be expelled from school if they commit a serious offense. However, the evidence in this analysis does not support this hypothesis. Rather than decreasing, suspensions for Black students and expulsion recommendations for all students increased under the new stricter policy. While it is unlikely that this policy change actually caused students to behave worse, it is more plausible that the behavior of District staff members changed following the expansion of zero tolerance discipline. Principals and assistant principals in particular are likely to have reacted to the new policy by suspending students committing moderately serious offenses for more days than before the policy was changed. The "three strikes" portion of the expanded zero tolerance discipline policy may have provided motivation for principals and assistant principals to deal with misbehavior more harshly. Knowing, for example, that a student who was just in a fistfight in the parking lot had already been suspended previously, may cause a principal to issue a 5-day suspension rather than a 3-days suspension for this offense, in order to reinforce the message to the student that a third serious offense will result in an expulsion recommendation.

School board members and policymakers more generally may be quite unaware of how these policies play out on a day-to-day basis in schools. While some students may be rather receptive to more specific and strict discipline policies, any deterrent effect is likely to affect the student body unevenly, and students who commit more and more serious offenses are less likely to be deterred than students who are more compliant and more connected to school. Also, decreasing the amount of subjectivity that principals have in making decisions about suspensions and expulsions may not have the intended effect. Indeed, some expulsion recommendations dictated by the aggravating factors analysis (such as requiring the recommendation for expulsion of students who cause US$500 in damage by inadvertently denting a car in the parking lot during a fistfight) remove subjective decision-making that is arguably best left to principals. Furthermore, decreased subjectivity

may actually increase the harshness of punishment that principals dole out, as they react to zero tolerance by signaling to students the heightened severity of the of the policies.

This analysis has several important limitations. First, this is an analysis of the *expansion* of zero tolerance discipline, rather than the initial implementation of such a policy. While the policy change was a clear expansion of zero tolerance discipline, this study likely substantially underestimates the causal impact on the Black–White discipline gap of an initial implementation of zero tolerance. Second, only 16% of variability in suspension days was explained. A large proportion of variability within District schools is left unexplained. In the percentage of days suspended for both District and non-District some schools reported zero suspensions while in other schools the percentage of days suspended exceeds 2% of total number of possible days. Third, this study examines the effects in only one mid-sized urban school district, and the data from this district may not be generalizable to other districts, particularly those that have fewer resources. Fourth, this analysis is limited in its statistical power because it relies primarily on publicly available data aggregated to the school level. Analyses using student-level data likely would produce more refined results. Similarly, because the data is limited, estimates of differences in the effect of zero tolerance discipline policy on suspensions of Hispanic, Asian, and Native American students, as well as by gender and socioeconomic status were not possible in this analysis, although they would certainly be of interest to the educational policy community. Finally, the focus on recommendations for expulsion rather than actual expulsions leaves many questions about the effects of zero tolerance discipline policies unanswered.

Conclusion

This analysis of the expansion of a zero tolerance policy in a diverse urban school district supports LaMarche's (2011) assertion that the time is *indeed* right to end zero tolerance policies in America's public schools. The practice of mandating predetermined disciplinary consequences for students does not appear to serve as a deterrent for students. Furthermore, zero tolerance policies have an especially harsh impact on Black students, exacerbating already severe disparities in school discipline between Black students and White students. In the District studied here, this zero tolerance discipline policy applies equally to all secondary students—including students as young as 11 years old. Denying students, particularly young students, access to schools, and the related counseling and social work services that schools provide is

not likely to cause students to improve their behavior. Furthermore, abdicating responsibility for providing a free and appropriate public education for students who behave badly does not serve the public interest. Rather, it kicks the can down the road to future public agencies that will end up dealing with citizens whose education has been significantly disrupted in the name of "consistency" and "get tough" and "no excuses."

Nearly three years after it expanded the zero tolerance discipline policy, the District Board of Education authorized the implementation of a program to serve some expelled students. The administration noted in a report to the Board that "[c]oncerns have been raised by members of the Board of Education. . .staff and the community about the zero tolerance model, lack of services to expelled students and the significant disruption caused in the lives of these students, families and neighborhoods when students are expelled." Presented as an exhibit in Board minutes for the meeting proposing the new program was an article in *District Administration* outlining replacing zero tolerance policies with a restorative justice approach. Schacter (2010) describes how the school district in Denver CO, discarded its zero tolerance discipline policy in favor of positive behavior support and restorative justice practices, after receiving input from community stakeholders, the police, and the district attorney's office. Ending zero tolerance, in favor of proactive and compassionate approaches to discipline policy, is an important part of solving the "discipline gap" in American schools, and providing all students in the community with the skills and habits necessary for a successful life.

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Notes

1. The National Center for Educational Statistics and the Office of Civil Rights define suspension as an out-of-school suspension, during which a student is excluded from school for disciplinary reasons for one school day or longer; it does not include students who served their suspension in the school. Expulsion is defined as the exclusion of a student from school for disciplinary reasons that results in the student's removal from school attendance rolls or that meets the criteria for expulsion as defined by the appropriate state or local school authority. For both suspensions and expulsions, students are counted only once, but may appear in both categories.
2. An expulsion recommendation is a very serious action taken by the school district, which begins in almost all cases with a 10-day suspension from school, a series of legal notices from school district lawyer, and an educational records review. This review process is designed to ascertain whether a student may have an undiagnosed educational disability "If at the end of the process the student is suspected to have a disability, the district conducts a special education evaluation of the student. The expulsion process is postponed during that evaluation and the student receives Off-Campus instruction, which is provided for 2 hr per day at a neutral site (library, community center, etc.). If the student is found to have a disability and the Manifestation Determination concludes that any discovered disability "was a substantial cause of the incident, then the case is dismissed. If not, then it proceeds through the expulsion process." If an expulsion recommendation continues beyond a Manifestation Determination, there is a "trial" presided over by a neutral hearing officer contracted by the school district, with the district represented by legal counsel. The decision of this hearing officer is forwarded to the Board of Education, for their review and ultimate disposition, in closed session.
3. Suspension data regarding students of other races/ethnicities is only sporadically available publicly, because data for racial groups with smaller numbers of students are frequently suppressed for student privacy.
4. Four small District alternative programs are excluded from this analysis of suspension data.
5. One of the neighboring high schools in the county which was large enough to consider including in the sample was not included, because data on the number of suspension days for Black students was suppressed for two consecutive years, due to the very small number of Black students in the school. One other school district in the same conference athletic conference also implemented a zero tolerance discipline policy, and was not included in the estimates of the secular trend.
6. Reviewed the publicly available student codes of conduct for the comparison school districts. None of the available records showed any evidence of substantial discipline policy changes, nor did most of the school districts expel more

than a handful of students per year—indeed if any pattern was evident, it was that expulsion rates were declining in the comparison school districts.

7. Several other analytic models yielded similar results, including fixed-effects regression using a logit-transform of the outcome variable, as well as fixed-effects regression of the raw percentages.
8. A small portion of the data about suspension days for schools in the sample is suppressed by the State Department of Education to protect student privacy. In circumstances where the number of days students of a particular race were suspended is very small but nonzero, it is state policy to report suspension days for students of that race combined with students from another race. For example, in three schools in the sample, for 1 year, the data for Black students is combined with students of another race. In these three cases, proportion of days suspended for the combined rate for Native American and Black students was used to estimate the rate for Black students. A sensitivity analysis regarding was conducted by dropping these cases and re-fitting the model. The resulting parameter estimates are virtually identical to those calculated using the full dataset.

References

Alison, P. D. (2009). *Fixed effects regression model.* Thousand Oaks, CA: Sage.

American Psychological Association. (2008). Are zero tolerance policies effective in the schools? An evidentiary review and recommendations. *American Psychologist, 63*, 852-862.

Angrist, J. D., & Pischke, J. (2009). *Mostly harmless econometrics: An empiricist's companion.* Princeton, NJ: Princeton University Press.

Bowditch, C. (1993). Getting rid of troublemakers: High school disciplinary procedures and the production of dropouts. *Social Problems*, *40* (4), 493 -509.

Casella, R. (2003). Zero tolerance policy in schools: Rationale, consequences, and alternatives. *Teachers College Record*, *105* (5), 872-892.

DeCuir, J. T., & Dixson, A. D. (2004). "So when it comes out, they aren't that surprised that it is there": Using critical race theory as a tool of analysis of race and racism in education. *Educational Researcher, 33*(5), 26-31.

DeMaris, A. (2004). *Regression with social data: Modeling continuous and limited response variables.* Hoboken, NJ: John Wiley.

Gillborn, D. (2005). Education policy as an act of white supremacy: Whiteness, critical race theory and education reform. *Journal of Education Policy, 20*, 485-505.

Gregory, A., & Mosely, P. M. (2004). The discipline gap: Teachers' views on the overrepresentation of African American students in the discipline system. *Equity & Excellence in Education, 37*, 18-30.

Gregory, A., Skiba, R., & Noguera, P. (2010). The achievement gap and the discipline gap: Two sides of the same coin? *Educational Researcher, 39*(1), 59-65.

Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice field like education? *International Journal of Qualitative Studies in Education, 11*(1), 7-24.

LaMarche, G. (2011, April 6) The time is right to end "zero tolerance." *Education Week.* Published in Print. Retrieved from http://www.edweek.org/ew/articles/2011/04/06/27lamarche.h30.html?r=901966954

McCarthy, J. D., & Hoge, D. R. (1987). The social construction of school punishment: Racial disadvantage out of universalistic process. *Social Forces, 65*, 1101-1120.

Murnane, R. J., & Willett, J. B. (2011). *Methods matter: Improving causal inference in educational and social science research.* New York, NY: Oxford University Press.

National Center for Educational Statistics (2009). School Characteristics and Climate. *Contexts of Elementary and Secondary Education.* Retrieved from http://nces.ed.gov/programs/coe/2009/section4/table-sdi-1.asp

National Center for Educational Statistics (2012). *America's youth: Transitions to adulthood.* Retrieved from http://nces.ed.gov/pubs2012/2012026

Nichols, J. D. (2004). An exploration of discipline and suspension data. *The Journal of Negro Education, 73*, 408-423.

Raffaele Mendez, L. M., & Knoff, H. M. (2003). Who gets suspended from school and why: A demographic analysis of schools and disciplinary infractions in a large school district. *Education and Treatment of Children, 26*(1), 30-51.

Schacter, R. (2010, January). Discipline gets the boot. *District Administration*. Retrieved from: http://www.districtadministration.com/viewarticle.aspx?articleid=2262

Skiba, R. J., Michael, R. S., Nardo, A. C., & Peterson, R. L. (2002). The color of discipline: Sources of racial and gender disproportionality in school punishment. *Urban Review, 34*, 317-342.

Skiba, R. J., & Rausch, M. K. (2006). Zero tolerance, suspension, and expulsion: Questions of equity and effectiveness. In Evertson, C. M. & Weinstein, C. S. (Eds.), *Handbook of classroom management: Research, practice, and contemporary issues* (pp. 1063-1089). Mahway, NJ: Lawrence Erlbaum.

StataCorp (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.

Sughrue, J. A. (2003). Zero tolerance for children: Two wrongs do not make a right. *Educational Administration Quarterly, 39*, 238-258.

Townsend, B. L. (2000). The disproportionate discipline of African American learners: Reducing school suspensions and expulsions. *Exceptional Children, 66*, 381-391.

U.S. Department of Education, National Center for Education Statistics. (1998) *Violence and discipline problems in U.S. public schools: 1996-97*, NCES 98-030, by Sheila Heaviside, Cassandra Rowand, Catrina Williams, and Elizabeth Farris. Project Officers, Shelley Burns and Edith McArthur. Washington, DC. Retrieved from http://nces.ed.gov/pubs98/98030.pdf

Zehr, M. A. (2010). Obama administration targets "disparate impact" of discipline. *Education Week.* Retrieved from http://www.edweek.org/ew/articles/2010/10/07/07disparate_ep.h30.html

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