

**UCLA**

**K-12 Racial Disparities in School Discipline**

**Title**

The Economic Effects of Exclusionary Discipline on Grade Retention and High School Dropout

**Permalink**

<https://escholarship.org/uc/item/7zc0c135>

**Authors**

Marchbanks, Miner P, III

Blake, Jamilia J

Booth, Eric A

et al.

**Publication Date**

2013-04-06

The Economic Effects of Exclusionary Discipline on Grade Retention and High School Dropout

Miner P. Marchbanks III

Jamilia J. Blake

Eric A. Booth

Dottie Carmichael

Allison L. Seibert

Texas A&M University

Tony Fabelo

Justice Center, Council of State Governments

Portions of this analysis were also made available in the technical report: Fabelo T, Thompson MD, Plotkin M, Carmichael D, Marchbanks MP III, Booth EA. (2011) Breaking Schools' Rules: A Statewide Study of How School Discipline Relates to Students' Success and Juvenile Justice Involvement. Council of State Governments Justice Center Publications. Accessible at: <http://justicecenter.csg.org/resources/juveniles>. Portions of this research were supported by the Atlantic Philanthropies and Open Society Foundations. The conclusions of the researchers are not those of, and are not endorsed by, Atlantic Philanthropies and Open Society Foundations the Texas Education Agency, the Texas Higher Education Coordinating Board, or the State of Texas. Please send all correspondence regarding this manuscript to Miner P. Marchbanks III, Public Policy Research Institute, Texas A&M University, [treyp@ppri.tamu.edu](mailto:treyp@ppri.tamu.edu); 979-458-3250.

### Abstract

Nearly 15% of students are disciplined in a given year, with 60% of students being disciplined at-least once between grades 7 through 12. The purpose of this study is to examine the impact of school discipline contact on students' risk for grade retention and school dropout using a statewide sample of 7<sup>th</sup> grade students tracked through their 12<sup>th</sup> grade year. Results indicate that school discipline is associated with approximately 4,700 grade retentions per year in the state of Texas. The delayed workforce entry related to grade retention has an effect of over \$68 million for the state, including \$5.6 million in lost tax revenue. Given the higher discipline rate for minorities, these costs disproportionately affect them. Further, the additional year of instruction costs the state nearly \$41 million dollars. For each year an individual student is retained the effect on the net social surplus exceeds \$23,000. Results also indicate that school discipline relates to a 29% increase in high school dropout. These additional dropouts account for an economic effect of \$711 million per year. It is recommended that educational agencies adopt evidenced-based programs that reduce school officials' use of punitive and exclusionary measures to manage student behavior such as Positive Behavioral Intervention Supports. Further, these results underscore the need for school officials to employ secondary and tertiary dropout prevention programs that are targeted at the most academically and behaviorally at-risk students in schools in addition to primary prevention programs.

## **The Economic Effects of Exclusionary Discipline on Grade Retention and High School Dropout**

Discipline sanctions are being utilized in schools in the United States at alarming rates to manage student behavior. More than 5% of students are expelled or receive an out-of-school suspension in a given year across four of the most ethnically diverse states in the country: California, Florida, New York, and Texas (Fabelo et al., 2011). In California alone, the annual rate of exclusionary discipline exceeds 12%. Whereas scholars have alluded to the detrimental effects of exclusionary discipline on student achievement, to date there has been no systematic state-wide investigation documenting the association of these practices with long-term academic outcomes for school-age youth. This study intends to fill this void by examining the relationship between exclusionary discipline and grade retention and dropout risk and by estimating the economic expense of exclusionary discipline for educational agencies in light of this significant association. To the extent that school discipline presents economic hardship on states, educational agencies should reexamine the need for exclusionary discipline and seek ways to limit its relationship with negative academic effects.

In 2008, the average high school dropout rate was 8% for adolescents and young adults living in the United States (ages 16 to 24), contrasted with dropout rates of 9.9% for African-Americans and 18.3% for Hispanics (Chapman, Laird, & Ramani, 2010). These statistics are consistent with historical trends over the past thirty years in which dropout rates for Black and Hispanic students have exceeded that of White students (Chapman et al., 2010). Given the societal and economic impact of high school dropout rates on future employment and criminal justice involvement, scholars have called for explanations and remedies for racial disproportion in high school non-completion (Alvarez et al., 2009; Orfield, Losen, Wald, & Swanson, 2004;

Swanson, 2006), leading some researchers to move beyond questioning who drops out of school, to the more fundamental question of why.

In general, there appear to be two types of students that fail to complete high school: students who are *pulled out* of school and those that are *pushed out* (Bradley & Renzulli, 2011; Jimerson, Anderson, & Whipple, 2002). Students who are *pulled out* of school are forced to leave due to personal circumstances such as pregnancy, or by the need to support one's family financially or as a caretaker. The predominate perception is that most of these students would complete high school if they did not have competing demands that conflict with their desires to attend and graduate (McNeal, 1997).

Conversely, students who are *pushed out* of school appear to exhibit undesirable traits that officials generally perceive as troublesome. They share many of the characteristics of students who are frequently subject to inequitable discipline practice (Bradley & Renzulli, 2011). *Pushed out* students are characterized as being academically disengaged, having tumultuous relationships with students and staff, and a history of academic and disciplinary problems. These students are believed to exit school prematurely due to feelings of alienation and low school connectedness that arise from their frequent involvement in the school discipline system.

Retained students or students that have repeated a grade represent a subset of students at risk of being *pushed out* towards dropout. The dominant perception is that retained students fail to complete high school because they are not academically capable of doing so. However, in their systematic review of the literature Jimerson and colleagues (2002) find retention itself is a greater predictor of dropout than academic performance. Across 17 studies, when prior academic achievement, standardized tests scores, aggression, and family background variables were controlled, students' history of grade retention, not academic performance, proved to be most

predictive of students' risk for leaving school. Although other meta-analytic studies have yielded much smaller effect sizes, when controlling for study design features and methodological quality, the extant literature still suggests that for some students grade retention is associated with school non-completion (Allen, Chen, Willson, & Hughes, 2009).

These findings imply that in order to fully understand the causes of high school dropout, factors that contribute to grade retention should also be investigated. Academic and behavioral problems have been carefully examined as risk factors. However, few empirical investigations have explored the role of persistent exposure to exclusionary discipline -- which involves removing students from the classroom setting for a specific period of time through means such as in-school suspension, out-of-school suspension, or expulsion -- on grade retention. Because children of color are disproportionately subject to sanctions involving classroom removal (see Costenbader & Markson, 1998; Garibaldi, 1992; Mendez & Knoff, 2003; Skiba et al., 2011; Skiba, Michael, Nardo, & Peterson, 2002), research establishing how exclusionary discipline can explain racial/ethnic disparities in educational outcomes is important for advancing the school discipline literature. The primary purpose of this study is therefore to examine the degree to which exposure to exclusionary discipline contributes to students' risk for grade retention and subsequent high school dropout. In order to influence educational policy, however, researchers must also establish the economic significance of educational practices on society. A second goal of this study, then, is to identify the economic impact of exclusionary discipline by way of its effects on grade retention and high school dropout.

### **Exclusionary Discipline and High School Dropout**

Studies over time have shown exclusionary discipline strategies to have a profound impact on students in numerous ways. Research dating back to the 1980's highlights the

association between exclusionary disciplinary rates and academic failure, high school dropout, grade retention, and juvenile justice involvement (Costenbader & Markson, 1998; DeRidder, 1990; Ekstrom, Goertz, Pollack & Rock, 1986; Gersch & Nolan, 1994; Rausch & Skiba, 2004; Safer, Heaton & Parker, 1981; Safer, 1986; Wehlage & Rutter, 1986). By design, exclusionary discipline strategies remove students from the classroom through placement of students in short-term, or possibly long-term, settings such as in-school suspension, out-of-school suspension, or alternative education discipline sites. As a result, these students receive fewer opportunities than their peers to obtain necessary classroom instruction, which increases the risk for academic failure (Losen & Skiba, 2010).

In addition to difficulties within the classroom, time spent outside the classroom can disrupt a student's long-term trajectory in learning necessary skills for overall academic performance. Arica (2006) found that standardized reading scores were lower for students who were suspended relative to those that were not and that achievement scores were lower for students who were suspended longer. Plausibly, students with lower academic skills are more likely to engage in disruptive and defiant behaviors to avoid academically demanding tasks, and it is these outbursts that result in the receipt of exclusionary discipline sanctions. However, also possible is that students who are frequently suspended from school suffer academically as a result of their time out of the learning environment. At the state-level, researchers have found an association between high school suspension rates and lower state accountability test scores (Skiba & Rausch, 2006). These findings imply that less class time results in missed opportunities for students to learn foundational academic skills necessary for meeting increasing academic demands and passing standardized tests. Students' failure to grasp academic tasks could result in

frustration and disengagement from school, creating a trajectory for academic failure and school dropout.

Indeed, students who frequently receive exclusionary discipline sanctions have been found to have greater levels of academic disengagement and negative perceptions of school compared to peers not involved in the school discipline system (Brown, 2007; Sekayi, 2001; Skiba & Noam, 2002; Wald & Kurlaender, 2003). Two independent investigations, Sekayi (2001) and Brown (2007), found commonalities among students in alternative education settings. Students removed from their campus for the purpose of discipline expressed feelings of resentment towards the school administration for the inability to attend school amongst their peers and reported poor relationships with teachers and administrators compared to students with lower suspension rates. Overall, the impact of exclusionary discipline practices results in suspended students perceiving their discipline consequences as being too punitive and not suitable for the act committed (Brown, 2007).

### **Exclusionary Discipline and Grade Retention**

Since exclusionary disciplinary sanctions result in a student's removal from essential classroom instruction, it is important to understand the possible association between these practices and grade retention. While grade retention has been used as an academic intervention for students failing to meet grade level standards (Allen et al., 2009; Anderson, Whipple, & Jimerson, 2002), the practice is highly controversial given its inconsistent effects on achievement and behavior outcomes (Jimerson, 2001, Hong & Yu, 2008; Wu, West, & Hughes, 2008; Hughes, Chen, Thoemmes, & Kwok, 2010). Many researchers have attributed the inconsistency in findings to poor methodological designs of studies analyzing the association between grade retention and academic achievement. For example, critics of grade retention commonly cite the



meta-analysis conducted by Jimerson (2001) which found negative effects of grade retention on academic achievement. Yet other researchers have questioned this conclusion based on the absence of a high quality comparison group of promoted students to control for baseline differences in key academic and social-emotional variables prior to the student being retained (Lorence, 2006; Allen et al., 2009).

Some studies have extended the existing literature on grade retention by examining its link with exclusionary discipline practices (Rodney, Crafter, Rodney, & Mupier, 1999; Safer, 1986). Chronic absenteeism due to discipline sanctions has been proposed as increasing a student's risk for grade retention given that many school policies connect grade promotion with regular attendance and successful passing of statewide achievement tests (Jimerson, 2001). It is plausible that if students are frequently removed from class due to disciplinary infractions, then missed classroom instruction not only equates to increased risk for academic failure, but also places students at-risk for repeating the same grade.

To understand linkages between exclusionary discipline and grade retention, scholars have also investigated the presence of racial/ethnic disparities in grade retention. Using data from the 2010 National Assessment of Educational Progress (NAEP), the American Psychological Association Presidential Task Force on Educational Disparities demonstrated that African American males and females were more likely to experience grade retention compared to White or Latino youth (American Psychological Association, 2012). Additionally, numerous studies have examined the long-term impact of grade retention predicting later high school dropout (Jimerson, 1999; Jimerson & Ferguson, 2007; Mann, 1987; Roderick, 1994).

## Study Purpose

Due to the existing research highlighting the association between exclusionary discipline and grade retention, as well as between grade retention and high school dropout, there is a need to examine the relationship between exclusionary discipline, grade retention, and high school dropout within a large representative sample of students. Prior research provides a compelling argument for the negative impact of exclusionary discipline practices on academic failure and school disengagement. However, studies have failed to control for individual- and school-level characteristics that can mitigate the effect of exclusionary discipline on student achievement. Further, the degree to which exclusionary discipline practices predict grade retention and high school dropout has not been fully explored in the school discipline literature. The purpose of the current study is to explore the degree to which school discipline is related to increased levels of grade retention and dropout. Further, this study assesses the economic costs of school discipline encounters that result from increased rates of grade retentions and dropouts.

## Methods

### Sample

The sample was drawn from the Texas Education Agency's (TEA) Public Education Information Management System (PEIMS). PEIMS is a statewide repository containing student records collected by all Texas school districts. From this extant database, educational records were extracted for all students enrolled in public school in the state of Texas from 1999 to 2007 who were in the 7<sup>th</sup> grade during the 2000-01, 2001-02 or 2002-03 academic years. As shown in Figure 1, students' progress was tracked from 7<sup>th</sup> grade through at least one year beyond their cohort's 12<sup>th</sup> grade year. The grades shown are those scheduled for the cohort as a whole, although it is possible some students were retained a grade. Students who were retained were tracked for evidence of completion at least one year beyond their cohort's senior year. The

sample is nearly evenly divided between White and Hispanic students, 43% and 40% respectively; African-American students make up 14% of the sample. The heterogeneity of Texas extends beyond race/ethnicity; there are over 1,200 school districts in the state with 38% of districts being in urban areas and 52% in non-urban areas. The remaining 10% of districts are located in counties that border Mexico.

### **Data Sources**

The educational records of all public school students in Texas in our cohort were compiled from PEIMS, a state level educational database, to form the target sample for this study. Educational records from 7<sup>th</sup> grade students' 6<sup>th</sup> grade year were also collected to provide control measures of students' prior academic achievement and educational history. As shown in Figure 1, students' progress was monitored from the 7<sup>th</sup> grade to at least one year beyond their cohort's 12<sup>th</sup> grade year. In addition, data concerning the characteristics of the school and district that students attended were included to provide contextual information regarding students' educational environment. Last, census data from the American Fact Finder and income data from the Texas Comptroller of Public Accounts data were collected to provide indicators of the community in which students resided.

### **Measures**

**Individual-level student characteristics.** The PEIMS database provides a method to track Texas students throughout their public school career. For the purpose of this study, we included the following individual-level student characteristics as predictor variables in study analyses: student demographic characteristics, attendance history, course completion, grade promotion, high school graduation, special program enrollment (e.g., special education, bilingual education, career and technology, gifted and talented), standardized test performance, and

discipline contact consistent with the extant school drop-out literature (Hammon, Linton, Smink, & Drew, 2007). A full list of control variables is available in Appendix I.

***Discipline Contact.*** Information about school discipline contact was obtained from the PEIMS database. In order for a discipline referral to be reported to TEA, a discipline event must rise to the level of in-school suspension (ISS; removal from the classroom, but kept at the home campus), out-of-school suspension (OSS; removal from the school for up to three days), expulsion (permanent or long term removal of the student from the school system), Disciplinary Alternative Education Placement (DAEP; the student is housed long-term in a campus designed to educate students who have exhibited serious or persistent behavior problems), or Juvenile Justice Alternative Education Placement (JJAEP; the student is housed long-term in a campus run by the juvenile justice department and designed to educate students who have exhibited serious or persistent behavior problems). As such, students who stay after school, are sent to the office, provided with a warning, or assigned to a diversionary program (e.g., student court) for discipline are not reported to TEA. For the purpose of this study, we used each of the reported discipline events included in the PEIMS database only: ISS, OSS, expulsion, DAEP or JJAEP.

Within our study cohorts, the majority of the students, 60%, experienced discipline. At the bivariate level, there is evidence of disproportionality with 75% of African-American students and 65% of Hispanics disciplined during their secondary school career compared to 49% of White children.

***Grade Retention.*** Grade retention, a dependent variable in study analyses, was obtained from the PEIMS database. Grade retention was determined based upon the grade of the student in the current year relative to the prior year. When the student was in the same grade in the fall as

he/she was in the spring of the previous year, they were classified as being retained. Retention was not available in years prior to 7<sup>th</sup> grade.

***School Dropout.*** School dropout, a second dependent variable, was also obtained from the PEIMS database. When a student leaves a school, either by withdrawal or by not returning in the following fall, the district is required to report a “leaver code” that indicates why the student is no longer attending the school. Some leaver codes simply indicate that a student transferred to another district, while others indicate that a student graduated; still others reflect a student who transfers to a private school. Beginning in the 2005-2006 school year, Texas adopted the more stringent, National Center for Education Statistics definition for dropouts. Students whose reason for leaving does not clearly exclude dropping out, such as attending private school, graduating or obtaining a GED are now classified as dropping out. Prior to 2005-2006, Texas classification of dropouts was less strict. For instance, students who completed all required coursework but failed the state standardized test required to graduate were not counted as dropouts (Texas Education Agency 2008). For the purposes of this study, we utilize the definition of dropping out that was used by TEA during each year from which the data is extracted.

**School-level Characteristics.** A complementary dataset to the PEIMS, the Academic Excellence Indicator System (AEIS) includes a variety of school-level measures such as school-level indicators of wealth and expenditures, teacher demographics and professional experience, student-teacher ratios, campus-wide attendance rates, discipline rates, dropout rates, and much more.<sup>1</sup> For the purpose of this study, the following variables were extracted from the AEIS:

---

<sup>1</sup> For a complete list of AEIS variables, visit

<http://ritter.tea.state.tx.us/perfreport/aeis/2011/glossary.html>.

school measures, county measures, academic measures, cohort measures, demographic measures, discipline measures, and unique measures. A full list of control variables used is in Appendix I.

**Community Characteristics.** In order to provide context describing an individual's community, county-level information was collected through the US Census American Fact Finder and through the Texas Comptroller of Public Accounts. Community level measures include urbanicity, household information and per-capita income. A full list of control variables used is available in Appendix I.

### **Data Analytic Strategy**

For both analyses, the student/year served as the unit of analysis. For example, students' probability of discipline and grade retention was examined independently each year they were in the sample. The effect of discipline on the probability that a student would dropout or be retained *at least once* was the focus of study analyses. Both of these are terminal outcomes, meaning once a student has been retained or dropped out they are not included in subsequent years' models. The analyses utilize multivariate techniques that statistically control for over 80 factors to produce a more accurate estimate of the true relationship between discipline and the outcomes of interest.<sup>2</sup>

## **Results**

### **Retention**

Table 1 details the relationship that exists between school discipline and first-time grade retention. Whereas all types of discipline were included in the model, ISS was reported as the exemplar discipline sanction since it is the least serious discipline sanction and is also the most common. A typical student with no discipline has a small probability of grade retention at only 0.009. A single ISS encounter nearly doubles the probability to 0.018 and was statistically

---

<sup>2</sup> See Appendix II for a detailed overview of the methodology.

significant. The effects on retention/dropout observed for other forms of discipline are largely similar to ISS.

In order to conduct the economic analysis, the probability that a student will be retained during their secondary school career is needed. A student who matriculates from 7th grade to 12th grade has six separate chances to be held back. Figure 2 indicates the serious effect that school discipline can have on long-term prospects for grade retention. As the figure shows, a typical student who is never disciplined has a probability of only 0.027 of being retained during their secondary school career. Being disciplined 3.2 times a year (the average number of discipline events for those disciplined in a year), each year, more than doubles a student's chances of being retained at least once with a probability of 0.063. The students in our cohort who receive discipline at least once between 7th through 12th grades average 1.4 discipline encounters per year. A typical student with this level of discipline has a 0.055 probability of being retained, which is more than double the rate for students with no prior discipline history. Also shown in the figure is that students who are given ISS once, in the 9th grade are 52% more likely to be retained during junior/senior high school than their peers who are never disciplined. A single discipline event at any time during a student's secondary academic career has a profound relationship on the likelihood that they will repeat a grade. To the extent that minority students are involved in school discipline more often than their white counterparts, as documented above, the findings suggest that they are likely also at higher risk for grade retention.

When a student is retained, there are serious economic consequences, both for the state and the individual student. The state of Texas and local school districts combine to spend an average of \$11,543 on each student per year (Texas Education Agency, 2012). When a student is

held back, the state is forced to spend these monies an additional year—this represents funds that would otherwise be available for other students and/or projects.

Of course, the retained student is more likely to drop-out, in which case the additional funds would not be expended. However, the overall costs to society would be even higher (Alvarez, et al 2008). Further, the analyses here examine the likelihood that a student is retained *at least once*. For students that are retained numerous times, the additional costs to the state are felt multiple times as well. If anything, then, the costs here are conservative. To the extent that a child drops out rather than be retained or is retained multiple times, the costs to the state would be greater than reported here.

The extent of the additional cost is magnified when one considers the size of the Texas public school system. Texas has over 4.9 million students enrolled, approximately 10 percent of all public school students in the nation (National Center for Education Statistics, 2012; Texas Education Agency, 2012). Each year, Texas receives more than 350,000 new students. For instance, the 2010-2011 8<sup>th</sup> grade cohort had 354,139 students (Texas Education Agency, 2012). Therefore when calculating annual costs it is necessary to extrapolate from the students modeled in the study to all students enrolled in the same grade and school year.

Using the 2010-2011 8<sup>th</sup> grade cohort for size and the racial breakdown from our study (12% African-American, 39% Hispanic and 43% White), after controlling for over eighty variables, Table 2 indicates the predicted increases in grade retention associated with school discipline by gender and race/ethnicity. Discipline among the three largest race/ethnicities in Texas leaves a per-year increase in retention of 5,445. While discipline-based retention of less than 2% of the cohort may seem trivial, the economic effects are profound. Spending the



additional \$11,543 on each of these students, results in an additional cost of nearly \$63 million per year.

The student does not fare much better. An additional year in school likely signals delayed entry into the workforce. Students who begin their career late miss out on the earning potential that time would otherwise allow. Individuals with only a minimum wage, fulltime position, will miss out on \$14,500 in earnings.<sup>3</sup> When the entire cohort is considered, this amounts to more than \$90 million in lost purchasing power. The Texas Comptroller of Public Accounts reports that households that earn less than \$29,233 spend 6% of their income on sales tax (Combs 2011, 45). This reduction still amounts to \$870 per person, or \$4.7 million. If the student were able to obtain a higher paying job, the costs would be magnified. For instance, if the individual pursued a career in the Army, they would be forgoing \$17,892, plus substantial benefits and additional food and housing allowances (United States Army, 2012). Further, since many wages/salaries, are determined by tenure on the job, the lower earning power can affect the student for the duration of their careers.

As the far right column of Table 2 indicates, the costs are not evenly borne across races or genders. Males consistently have higher per-capita costs than females due to their higher rates of discipline. Further, Latino and African-American males have the highest per-capita costs due to their elevated discipline rates relative to White students.

### **Dropout**

Overall, 6.7% of our study cohort dropped out of school. While 10% of those that were disciplined dropped out, only 2% of those who were not disciplined ultimately dropped out. As

---

<sup>3</sup> Texas utilizes the national minimum wage of \$7.25/hour. Total earnings calculated at \$7.25 x 40 hours x 50 weeks.

Table 3 indicates, a typical student who receives one ISS placement during the year is 29.6% more likely to dropout during that year. This finding is statistically significant. Like grade retention, the effects of school discipline can occur each year that a student is present. This makes the overall likelihood of dropout dependent upon multiple years of discipline exposure, rather than a single year. Figure 2 represents the effects of regular school discipline on the probability that a student will formally dropout of school. Recall that of the students in our cohort who receive discipline in the 7th through 12th grades, they average 1.4 discipline encounters per year. These students are 29% more likely to dropout at some point during their secondary school career.<sup>4</sup> This value is likely conservative. Recall that Texas increased the strictness of its dropout measure during the time the study cohorts were in school. If the more inclusive measure of dropout was used in all years, the dropout rates would almost certainly be higher. In fact, the official dropout rate for the class of 2007 is twice as high as the class of 2005, the last class completely under the old rules. (Texas Education Agency 2008, 56, 94)

However, the 29% increase in dropping out for those who are disciplined provides a platform to investigate the costs associated with school discipline through its relationship with dropping out. If the 59% of students who are disciplined dropped out at rates comparable to their peers who avoided punishment, the overall dropout rate in Texas would be approximately 13% lower.

---

<sup>4</sup> The multivariate dropout rate reported is substantially smaller than the overall dropout rate. This is due to the base individual reported being the “typical” student. Such a student has never failed a standardized test, is not poor or classified as at-risk of dropping out of school by TEA. When these factors are adjusted, the overall rate of dropping out increases, but the effect of discipline remains close to 29%.

A recent study examined the economic costs associated with dropouts from a single Texas cohort (Alvarez et al., 2009). This impressive analysis uses a vast array of data to calculate these values. First, using Census data and adjusting for the demographics of the state, the study finds that a single cohort's dropouts have between \$5.0 billion and \$9.0 billion in present value lost wages over the course of their careers. Using Texas State Comptroller data, they also find that the state foregoes between \$279 million and \$507 million in lost sales tax revenue over the course of the cohort's students' lifetimes. Next, the study examines the increased welfare costs associated with dropouts and finds the value to be between \$404 million and \$736 million. The welfare figures are conservative because they ignore the differences in the number of children dropouts have relative to graduates—a key predictor of welfare expenses. Subsequently, the study utilizes existing research to determine the increased criminal justice costs associated with dropouts, finding that these costs are between \$595 million and \$1.0 billion. Last, the study acknowledges that dropouts do provide savings to the state in one area—the cost of education. The authors estimate this savings to be between \$625 million and \$1.1 billion.

The total social cost of dropout in the Alvarez et al. study (2009) totals between \$5.4 billion and \$9.6 billion. If the state were able to reduce the effects of discipline on likelihood of dropping out by 13%, the level associated with school discipline, the total savings would be between \$711 million and \$1.3 billion. Even if the actual cost savings are modest relative to these estimates, there is a tremendous amount of savings to be realized by addressing school discipline and its relationship to the likelihood of dropping out.

### **Discussion**

The results indicate that the negative effects of school discipline do not end with the individual exclusionary suspension or expulsion. Involvement in school discipline is associated

with at least two further deleterious outcomes—grade retention and dropping out of the school system. The effects of these negative outcomes are felt by not only the individual, but by society as a whole.

Previous research has largely neglected the economic costs associated with school discipline. This research shows that students who are disciplined are more likely to be retained and to dropout, and that there are serious economic costs associated with these negative outcomes. We estimate that grade retentions associated with discipline cost the state of Texas \$72 million per year. Further, those who are disciplined are significantly more likely to dropout. This increase in dropout is associated with \$711 million dollars in increased costs and lost wages. This study ignores other economic costs associated with school discipline. For instance, Fabelo, et al. (2011), establish that those individuals who are disciplined are much more likely to move into the juvenile justice system. As such, the costs estimated in this study are conservative.

The results of this study should be interpreted in light of several limitations. One limitation of this study is the method in which school dropout was conceptualized. Controversy exists surrounding how states measure school dropout rates. The ambiguity in the state of Texas' coding of students who exit school prior to graduating forced us to adopt an overly conservative and restrictive definition of school dropout that might not extend to other studies measuring this construct more liberally. As mentioned above, Texas relies upon exit codes for students to determine dropouts. However, many students likely exit school while claiming to pursue home-schooling or a move out of state. It is possible that the adoption of this restrictive definition caused us to miss a number of students who actually ended their public school careers without a diploma or continued their education through private or home schooling. This restrictive definition might have led to a dramatic undercounting of dropouts within our cohort. For

instance, only 7% of students within our cohort formally dropout compared to the 31% of students who did not graduate for all reasons combined. Of course, some of the students in our cohort that did not graduate likely had legitimate reasons—such as moving out of state or attending private school. However, the likelihood of the difference being this large is small. Still, this limited definition can provide a clue as to how school discipline relates to dropping out of school. While it is possible that the relationship between school discipline and the likelihood of dropping out differs for students who do not formally dropout, they likely do not dramatically differ.

Additionally, the study cannot explore the mechanisms by which school discipline or the associated negative outcomes can be prevented. Although state-level educational databases provide a variety of measures on students' educational status and trajectory, educational records often have limited depth and restrict researchers ability to explore the nuances in behaviors that affect a students' outcomes. Future investigations should work in a handful of campuses to explore what programs of promise are available to limit the need for school discipline and to prevent the negative outcomes associated with it.

Despite the limitations of this study, the findings offer greater insight into the role of exclusionary discipline on grade retention and school dropout and the expense of this disciplinary technique. As such, education agencies would be well served to explore the causes of the association between school discipline and negative academic outcomes given the economic burden exclusionary discipline places on schools and society as a whole. Since administrators are able to affect the level of discipline that occurs in their schools, they can take measures to reduce discipline and, in turn, its deleterious effects (Booth, et al 2012, Fabelo, et al 2011).

It is recommended that educational agencies adopt evidenced-based programs that reduce school officials' use of punitive and exclusionary measures to manage student behavior such as Positive Behavioral Intervention Supports (PBIS; Fenning & Rose, 2007).<sup>5</sup> PBIS is a comprehensive school-wide behavior management program that provides proactive alternatives to managing student behavior through reinforcement, behavior modeling, and the development of an infrastructure for monitoring and evaluating the effectiveness of student's adherence to school rules (Sugai et al., 2000). By requiring school officials to operationally define school rules into positive behavioral standards that they wish students to display, PBIS allows for consistent communication to students regarding school officials' expectations for student conduct. This adoption of universal standards for student behavioral has the potential to minimize bias in identifying discipline infractions and the assignment of discipline sanctions and ultimately, curtail school officials' overreliance on discipline referrals to manage student behavior. However, even under the PBIS framework there will be a small segment of the student population that needs additional support to meet these standards of behavior. Thus, it behooves school officials to employ secondary and tertiary dropout prevention programs that are targeted at the most academically and behaviorally at-risk students in schools in addition to PBIS.

To do this, educational administrators should identify students who are at-risk for receiving frequent discipline sanctions by monitoring the number of classroom and office

---

<sup>5</sup> The recommendations discussed here are those of the researchers and do not represent official recommendations by the Justice Center of the CSG. The Justice Center is leading a national initiative in this area to reach consensus on recommendations and these will be issued by the center at a future time.

discipline referrals these students receive. Students who receive elevated discipline referrals (e.g., over the mean level for their grade) should be included in two distinct types of dropout prevention programs adopted by the school, a dropout prevention program that focuses on the attainment of requisite academic skills necessary for school success and a dropout prevention program that fosters school engagement by building positive relationships with meaningful adults in the student's school (Sugai, Sprague, Horner, & Walker, 2000). Evidenced-based academically oriented dropout prevention programs should be implemented since students with elevated discipline referrals may use misbehavior as a strategy to escape academic tasks. These programs will also be critical for students with an extensive discipline history who have significant gaps in their academic skills as a result of missed instructional time due to the receipt of exclusionary discipline sanctions. In addition to addressing at-risk students academic skill deficits, school officials should adopt prevention programs that attempt to reintegrate at-risk students into the school setting and rebuild these students' relationships with their teachers, peers, and educational administrators. The formation of such alliances will likely reduce feelings of school disconnection and encourage school completion. Programs that use adult mentors to monitor at-risk students attendance, motivation, and engagement in school may foster levels of school belonging that may be helpful in disrupting the cycle of exclusionary discipline and high school dropout.

### **Conclusion**

This research supports other literature indicating a relationship between school discipline involvement and poor academic outcomes (Arica, 2006; Brown, 2007; Sekayi, 2001; Skiba & Noam, 2002; Skiba & Rausch, 2006). Where this research adds to the literature is in identifying the economic costs associated with the school discipline through these negative outcomes. Using

a robust sample of 900,000, the analyses show that students' receipt of exclusionary discipline is associated with negative academic outcomes and that, further, there are serious economic costs for both the student and state associated with these negative outcomes. To the extent that minority students are overrepresented in the school discipline setting (as the literature suggests, see Costenbader & Markson, 1998; Garibaldi, 1992; Mendez & Knoff, 2003; Skiba et al., 2011; Skiba, Michael, Nardo, & Peterson, 2002), they are likely experiencing higher levels of grade retention and dropout as well. Future research should explore programs that can disrupt, or eliminate this relationship and/or prevent discipline in the first-place.

Draft: Not for circulation or citation without express consent of the author(s)



### References

- Allen, C., Chen, Q., Willson, V., & Hughes, J. N. (2009). Quality of design moderates effects of grade retention on achievement: A meta-analytic, multi-level analysis. *Educational Evaluation and Policy Analysis*, 31, 480-499.
- Alvarez, R., Brennan, S., Carter, N., Dong, H.K., Eldridge, A., Fratto, J., . . . Taylor, L. (2009). *The ABCD's of Texas education: Assessing the benefits and costs of reducing the dropout rate*. College Station, TX: The Bush School of Government and Public Service at Texas A&M University.
- Anderson, G.E., Whipple, A.D., & Jimerson, S.R. (2002). Grade retention: Achievement and mental health outcomes. *The California School Psychologist*, 7, 51-62.
- American Psychological Association, Presidential Task Force on Educational Disparities. (2012). *Ethnic and racial disparities in education: Psychology's contributions to understanding and reducing disparities*. Retrieved from <http://www.apa.org/ed/resources/racial-disparities.aspx>
- Arcia, E. (2006). Achievement and enrollment status of suspended students: Outcomes in a large, multicultural school district. *Education and Urban Society*, 38, 359–369.
- Booth, Eric A., Marchbanks, Miner P., Carmichael, Dottie & Fabelo, Tony. (2012). Comparing Campus Discipline Rates: A Multivariate Approach for Identifying Schools with Significantly Different than Expected Exclusionary Discipline Rates. *Journal of Applied Research on Children: Informing Policy for Children at Risk*. 3(2): Art. 6.
- Bradley, C.L. & Renzulli, L.A. (2011). The complexity of non-completion: Being pushed or pulled to drop out of high school. *Social Forces*, 90(2), 521-545.

- Brown, T.M. (2007). Lost and turned out: Academic social and emotional experiences of students excluded from school. *Urban Education*, 42, 432-455.
- Chapman, C., Laird, J. & KewalRamani, A. (2010). Trends in high school dropout and completion rates in the United States: 1972-2008 compendium report. Washington, DC: US Department of Education.
- Combs, S. (2011). Tax Exemptions & Incidence: A Report to the Governor and the 82<sup>nd</sup> Texas Legislature. Accessed at <http://www.window.state.tx.us/taxinfo/incidence/96-463TaxIncidence02-11.pdf>.
- Costenbader, V., & Markson, S. (1998). School suspension: A study with secondary school students. *Journal of School Psychology*, 36, 59-82.
- DeRidder, L. M. (1990). The impact of school suspensions and expulsions on dropping out. *Educational Horizons*, 68, 153-157.
- Ekstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D. A. (1986). Who drops out of high school and why?: Findings from a national study. *Teachers College Record*, 87, 357-73.
- Fabelo, T., Thompson, M., Plotkin, M., Carmichael, D., Marchbanks, M., Booth, E. (2011). Breaking Schools' Rules: A Statewide Study of How School Discipline Relates to Students' Success and Juvenile Justice Involvement.
- Fenning, P., & Rose, J. (2007). Overrepresentation of African American students in exclusionary discipline: The role of school policy. *Urban Education*, 42 (6), 536-559.
- Garibaldi, A.M. (1992). Educating and motivating African American males to succeed. *The Journal of Negro Education*, 61, 4-11.
- Gersch, I., & Nolan, A. (1994). Exclusions: What the children think. *Educational Psychology in Practice*, 10, 35-45.

Greene, W. H. (2003). *Econometric analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Gregory, A., Skiba, R., & Noguera, P. (2010). The achievement gap and the discipline gap: Two sides of the same coin? *Educational Researcher*, 39, 59–68.

Gujarati, D. N. (1995). *Basic econometrics* (3rd ed.). New York, NY: McGraw Hill.

Hammond, C., Linton, D., Smink, J., & Drew, S. (2007). *Dropout risk factors and exemplary programs*. Clemson, SC: national Dropout Prevention Center, Communities in Schools, Inc.

Hong, G., & Yu, B. (2008). Effects of kindergarten retention on children's social-emotional development: An application of propensity score method to multivariate, multilevel data. *Developmental Psychology*, 44, 407-421.

Hughes, J.N., Chen, Q., Thoemmes, F., & Kwok, O. (2010). An investigation of the relationship between retention in first grade and performance on high stakes test in 3rd grade. *Educational Evaluation and Policy Analysis*, 32, 166-82.

Jimerson, S.R. (1999). On the failure of failure: Examining the association of early grade retention and late adolescent education and employment outcomes. *Journal of School Psychology*, 37, 243-272.

Jimerson, S.R. (2001). Meta-analysis of grade retention research: Implications for practice in the 21st century. *School Psychology Review*, 30, 420-437.

Jimerson, S.R., Anderson, G., & Whipple, A. (2002). Winning the battle and losing the war: Examining the relation between grade retention and dropping out of high school. *Psychology in the Schools*, 39(4), 441-457.

- Jimerson, S.R., & Ferguson, P. (2007). A longitudinal study of grade retention: Academic and behavioral outcomes of retained students through adolescence. *School Psychology Quarterly*, 22(3), 314-339.
- Long, J.S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: SAGE Publications, Inc.
- Lorence, J. (2006). Retention and academic achievement research revisited from a United States perspective. *International Education Journal*, 7, 731–777.
- Losen, D.J., & Skiba, R. (2010). *Suspended education: Urban middle schools in crisis*. Retrieved from <http://civilrightsproject.ucla.edu/research/k-12-education/school-discipline/suspended-education-urban-middle-schools-in-crisis>
- Mann, D. (1987). Can we help dropouts: Thinking about the undoable. *Teacher College Record*, 87, 307-323.
- McNeal, R. (1997). Are students being pulled out of high school? The effect of adolescent employment on dropping out. *Sociology of Education*, 70, 206-220.
- 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.
- National Center for Education Statistics. (2012). *Enrollment in educational institutions, by level and control of institution: Selected years, 1869-70 through fall 2019*. Retrieved from [http://nces.ed.gov/programs/digest/d10/tables/dt10\\_003.asp](http://nces.ed.gov/programs/digest/d10/tables/dt10_003.asp)
- Orfield, G., Losen, D., Wald, J., & Swanson, C. (2004). *Losing our future: How minority youth are being left behind by the graduation rate crisis, 2004*. Cambridge, MA: The Civil

Rights Project at Harvard University. Contributors: Advocates for Children of New York, The Civil Society Institute.

Rausch, M. K., & Skiba, R. J. (2004). *Unplanned outcomes: Suspensions and expulsions in Indiana*. Bloomington, IN: Center for Evaluation and Education Policy.

Roderick, M. (1994). Grade retention and school dropout: Investigating the association. *American Educational Research Journal*, 31, 729-759.

Rodney, L.W., Crafter, B., Rodney, H.E., & Mupier, R.M. (1999). Variables contributing to grade retention among African American adolescent males. *Journal of Educational Research*, 92, 185-190.

Safer, D.J. (1986). Nonpromotion correlates and outcomes at different grade levels. *Journal of Learning Disabilities*, 19(8), 500-503.

Safer, D., Heaton, R., & Parker, F. (1981). A behavioral program for disruptive junior high students: Results and follow-up. *Journal of Abnormal Child Psychology*, 9, 483-494.

Sekayi, D.N.R. (2001). Intellectual indignation: Getting at the roots of student resistance in an alternative high school program. *Education*, 122(2), 414-422.

Skiba, R.J., Horner, R. H. Chung, C.G., Rausch, M.K., May, S.L., & Tobin, T. (2011). Race is not neutral: A national investigation of African American and Latino disproportionality in school discipline. *School Psychology Review*, 40, 85-107.

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

Skiba, R. J., & Noam, G. G. (2002). *Zero tolerance: Can suspension and expulsion keep schools safe?: New directions for youth development*. San Francisco, CA: Jossey-Bass.

- Skiba, R. J., & Rausch, M. K. (2006). Zero tolerance, suspension, and expulsion: Questions of equity and effectiveness. In C. M. Evertson & C. S. Weinstein (Eds.), *Handbook of classroom management: Research, practice, and contemporary issues* (pp. 1063-1089). Lawrence Erlbaum Associates.
- Sugai, G. P., Horner, R. H., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson, C. M. et al. (2000). Applying positive behavior support and functional assessments in schools. *Journal of Positive Behavioral Interventions*, 2(3), 135-141.
- Sugai, G. P., Sprague J. R., Horner, R. H., Walker H. M. (2000). Preventing school violence: The use of office discipline referrals to assess and monitor school-wide discipline interventions. *Journal of Emotional and Behavioral Disorders*, 8(2), 94-101.
- Swanson, C.B. (2006). High school graduation in Texas: Independent research to understand and combat the graduation crisis. Editorial Projects in Education Research Center, Bethesda, MD.
- Texas Education Agency. (2008). Secondary School Completion and Dropouts in Texas Public Schools 2006-07. Retrieved from [http://ritter.tea.state.tx.us/research/pdfs/dropcomp\\_2006-07.pdf](http://ritter.tea.state.tx.us/research/pdfs/dropcomp_2006-07.pdf).
- Texas Education Agency. (2012). 2011 State AEIS report. Retrieved from <http://ritter.tea.state.tx.us/perfreport/aeis/2011/state.html>.
- United States Army. (2012). Army base pay and basic pay chart. Retrieved from <http://www.goarmy.com/benefits/money/basic-pay-active-duty-soldiers.html>
- Wald, J., & Kurlaender, M. (2003). Connected in Seattle? An Exploratory Study of Student Perceptions of Discipline and Attachments to Teachers. *New Directions for Youth Development: Theory, Practice and Research*, 99, 35-54.

Wehlage, G.G., & Rutter, R.A. (1986). Dropping out: How much do schools contribute to the problem? *Teachers College Record*, 87, 374-392.

Wu, W., West, S.G., & Hughes, J.N. (2008). Effect of retention in first grade on children's achievement trajectories over four years: A piecewise growth analysis using propensity score matching. *Journal of Educational Psychology*, 100, 727-740.

Draft: Not for circulation or citation without express consent of the author(s)

		School Year									
		1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
School Grade - Class	6th								X	X	X
	7th										
	8th										
	6th									X	X
	7th										
	8th										
	9th										
	10th										
	11th										
	12th										
	6th										
	7th										
	8th										
	9th										
	10th										
	11th										
	12th										
	6th										
	7th										
	8th										
	9th										
	10th										
	11th										
	12th										

**Figure 1: Study cohorts and grades studied.**

Draft: Not for circulation or citation without express consent of author(s)



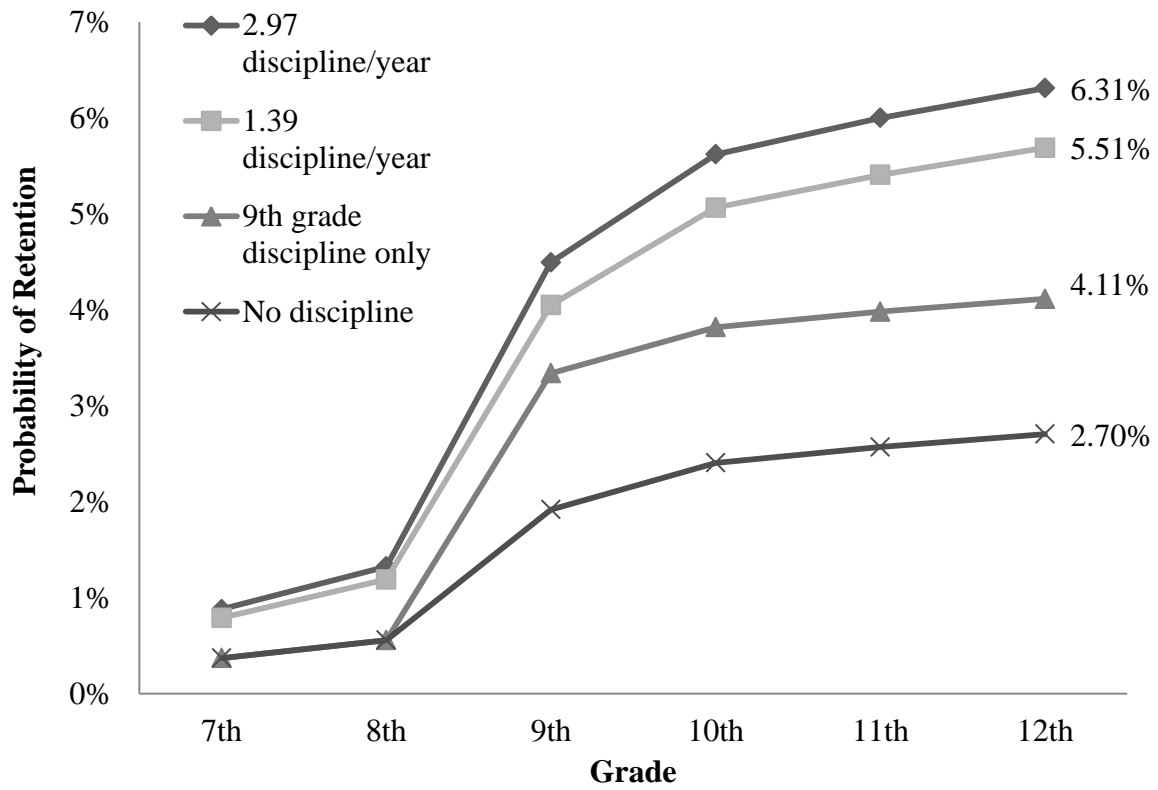


Figure 2. School discipline involvement and increased rates of grade retention.

Draft: Not for circulation or citation

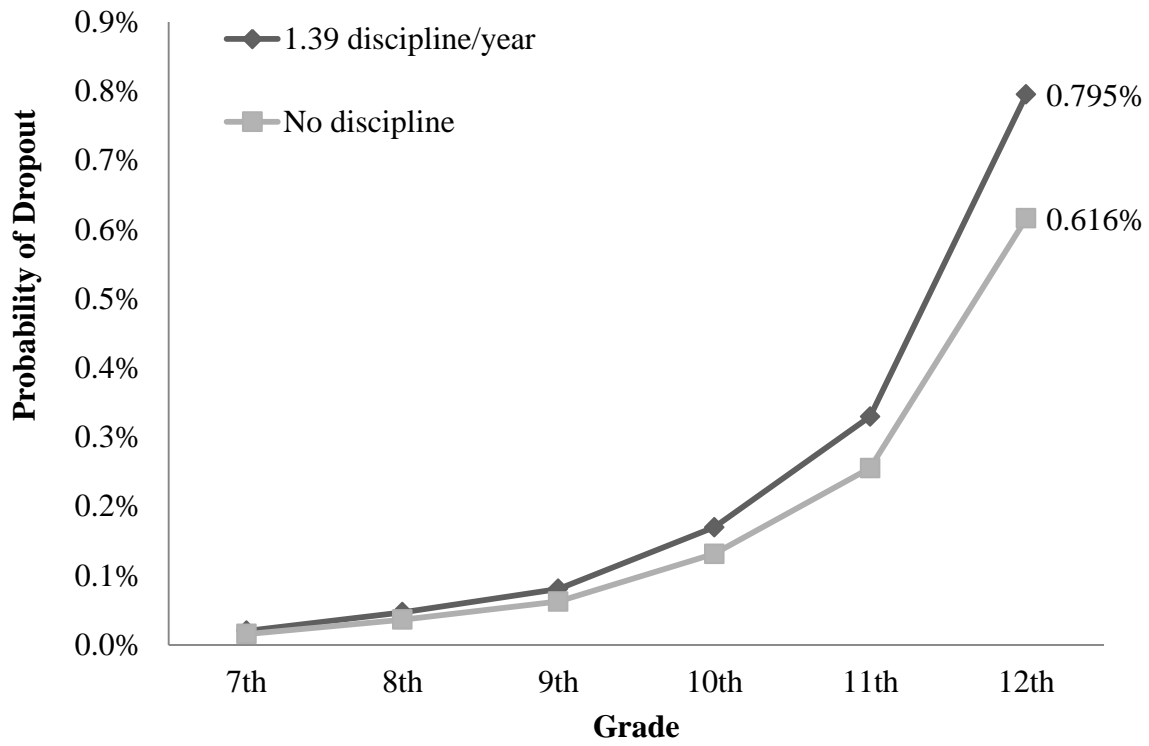


Figure 3. School discipline involvement and increased rates of dropout.

Draft: Not for circulation or citation without

Table 1  
*School Discipline and Likelihood of Grade Retention*

Characteristic	Label	Raw probability	Percent increase
Base	No discipline	0.009	....
	One in-school suspension	0.018	98.7%

Draft: Not for circulation or citation without express consent of the author(s)

Table 2

*School Discipline Related to Predicted Grade Retention and Cost Increases*

Race	Gender	Discipline Rate	Increased Retention	Education Costs	Lost Wages	Lost Sales Tax	Total	Per Capita
Black	Male	83%	488	\$5,638,282	\$7,082,655	\$424,959	\$13,145,896	\$606.46
Black	Female	70%	330	\$3,808,402	\$4,784,010	\$287,041	\$8,879,452	\$409.63
Latino	Male	74%	1,676	\$19,346,549	\$24,302,604	\$1,458,156	\$45,107,310	\$644.98
Latina	Female	58%	1,054	\$12,170,842	\$15,288,678	\$917,321	\$28,376,841	\$405.75
White	Male	59%	1,262	\$14,569,263	\$18,301,509	\$1,098,091	\$33,968,862	\$445.40
White	Female	37%	634	\$7,320,583	\$9,195,915	\$551,755	\$17,068,253	\$372.08
Total		60%	5,445	\$62,853,920	\$78,955,371	\$4,737,322	\$146,546,614	\$436.47

Draft: Not for circulation or citation without express consent of the author(s)

Table 3  
*School Discipline and Likelihood of Dropout*

Characteristic	Label	Raw probability	Percent increase
Base	No discipline	0.0003	....
	One in-school suspension	0.0004	29.6%

Draft: Not for circulation or citation without express consent of the author(s)

## Appendix I

*Variables Included in Analysis*

Measures	Label	Definition	Type
School	Charter school	Student attends a charter school	Binary
	Title I school	Student attends a Title I school	Binary
	Exemplary campus	Campus accountability rating is "exemplary"	Binary
	Recognized campus	Campus accountability rating is "recognized"	Binary
	Unacceptable campus	Campus accountability rating is "unacceptable"	Binary
	Missing rating	Campus accountability rating is "missing"	Binary
	AEA-acceptable campus	Alternative education accountability campus rating is "acceptable"--For alternative campuses only	Binary
	AEA-unacceptable campus	Alternative education accountability campus rating is "unacceptable "--For alternative campuses only	Binary
	Campus attendance rate	Attendance rate reported in AEIS based on student attendance for the entire school year.	Continuous
	Campus dropout rate	Annual campus dropout rate (grades 7-12). Includes mobile students in the denominator. See <a href="http://www.tea.state.tx.us/index4.aspx?id=4080">http://www.tea.state.tx.us/index4.aspx?id=4080</a>	Continuous
	Student/teacher ratio	The number of students per teacher on the campus	Continuous
	Percent bilingual/ESL education	Percent students at the campus enrolled in bilingual/ESL education	Continuous
	Percent career and technical education	Percent students at the campus enrolled in career and technical education	Continuous
	Percent special education	Percent students at the campus enrolled in special education	Continuous
	Percent met standard on all TAKS subjects	Percent of students at the campus that met the standard on all TAKS subjects (state test)	Continuous
	Percent economically disadvantaged	Percent of students at the campus eligible for free or reduced-price lunch or other public assistance	Continuous
	Average actual salaries of teachers	Average salary paid to each FTE teacher at the campus	Continuous
	Average years experience of teachers	Average years experience for teachers at the campus	Continuous

	Per-capita instructional money	Average total instructional expenditures per student at the campus	Continuous
	District wealth per capita	Total taxable property value per student	Continuous
	Diversity measure (student)	Measure of student diversity at the campus. Calculated:  $1 - (\text{Percent Black students})^2 - (\text{Percent White students})^2 - (\text{Percent Hispanic students})^2 - (\text{Percent Other students})^2$  [0 = perfect homogeneity; 0.75 = perfect diversity]	Continuous
	Diversity measure (teacher)	Measure of teacher diversity at the campus. Calculated:  $1 - (\text{Percent Black teachers})^2 - (\text{Percent White teachers})^2 - (\text{Percent Hispanic teachers})^2 - (\text{Percent Other teachers})^2$  [0 = perfect homogeneity; 0.75 = perfect diversity]	Continuous
	Student/Teacher Racial Congruence (Higher Value = less congruence)	Chi-square based measure indicating the student/teacher racial congruence at the campus. [0= perfect congruence. Higher values indicated less congruence (more differences)]	Continuous
County	Suburban county	Student lives in a suburban county	Binary
	Non-metro adjacent county	Student lives in a non-metro county adjacent to a metro county	Binary
	Rural county	Student lives in a rural county	Binary
	Percent single parent families	Percent of families in the student's county headed by either a father or mother only (2000 Census)	Continuous
	Percent of population with diploma	Sum total of the percent of 25 + year olds within the student's county with one of the following educational attainments: high school graduate (includes equivalency;) some college, no degree; associate degree; bachelor's degree or graduate/professional degree	Continuous
	Percent homes rented	Percent of occupied homes in the student's county that are rented by the occupant (2000 Census)	Continuous

	Average household size in county	Average household size in student's county (2000 Census)	Continuous
	Income per capita	2006 per capita income in the student's county (Comptroller's Office)	Continuous
Academic	At-risk of dropping out	Student is at-risk of dropout (TEA designation)	Binary
	Gifted	Student is classified as gifted	Binary
	Vocational education	Student is in a vocational education class	Binary
	Has failed a TAKS test	Student has failed a TAAS/TAKS test (state test) before--during our study period	Binary
	Failed last TAKS test	Student failed at least one section of the TAAS/TAKS test (state test) at least one time the last year s/he took the exam.	Binary
	Retained	Student was retained in the previous year	Binary
	Years behind	Number of years student is behind expected grade level	Continuous
	Attendance rate	Student's attendance rate	Continuous
Cohort	7th grade	Student is in the 7th grade	Binary
	8th grade	Student is in the 8th grade	Binary
	9th grade	Student is in the 9th grade	Binary
	9th grade * held back	Student is in the 9th grade and is at least two years behind expected grade level	Binary
	10th grade	Student is in the 10th grade	Binary
	11th grade	Student is in the 11th grade	Binary
	Cohort year	The number of years the student's cohort has been in the study	Continuous
	African-American * cohort year	The cohort year for African-American students, all other students receive a 0	Continuous
	Latino * cohort year	The cohort year for Latino students, all other students receive a 0	Continuous
	Other race * cohort year	The cohort year for Other Race students, all other students receive a 0	Continuous
Demographic	African-American	Student is African-American	Binary
	Latino	Student is Hispanic	Binary
	Other race	Student is not a White, Hispanic or Black student	Binary
	Male	Student is male	Binary
	African-American in a non-African-American majority school	Student is African-American in a school with a majority of students that are non-African-American, must be a clear majority of another race	Binary



	Hispanic in a non-Hispanic majority school	Student is Hispanic in a school with a majority of students that are non-Hispanic, must be a clear majority of one race	Binary
	Other race in a non-other race majority school	Student is "other race" in a school with a majority of students that are non-"other race," must be a clear majority of one race	Binary
	White in a non-White majority school	Student is White in a school with a majority of students that are non-White, must be a clear majority of one race	Binary
	Autism	Student is diagnosed with autism	Binary
	Emotional disturbance	Student is diagnosed with an emotional disturbance	Binary
	Learning disability	Student is diagnosed with a learning disability	Binary
	Mental retardation	Student is diagnosed with mental retardation	Binary
	Physical disability	Student is diagnosed with either an orthopedic impairment, auditory impairment, visual impairment, deaf-blind, speech impairment, non-categorical early childhood or other health impairment	Binary
	Traumatic brain injury	Student is diagnosed with a traumatic brain injury	Binary
Discipline	Disciplined	Student was disciplined	Binary
	encountered TJPC in the past	Student was referred to TJPC in the past	Binary
	Number of ISS disciplinary actions	Total number of discipline events where the action taken was in-school suspension	Continuous
	Number of OSS disciplinary actions	Total number of discipline events where the action taken was out-of-school suspension	Continuous
	Number of DAEP disciplinary actions	Total number of discipline events where the action taken was referral to a DAEP	Continuous
	Number of JJAEP disciplinary actions	Total number of discipline events where the action taken was referral to a JJAEP	Continuous
	Number of expulsion disciplinary actions	Total number of discipline events where the action taken was expulsion	Continuous
	Number of fine disciplinary actions	Total number of discipline events where the action taken was truancy-related fines	Continuous

	Number of no action disciplinary actions	Total number of discipline events where no action was taken	Continuous
	Number of unknown disciplinary actions	Total number of discipline events where the action taken was not reported.	Continuous
	Number of TJPC referrals	The number of TJPC referrals that the student had in the year	Continuous
Unique	Title I Ind.	Student receives Title I services	Binary
	Economical disadvantaged	Student is eligible for free or reduced-price lunch or other public assistance	Binary
	Limited English Proficiency	Student is classified as having limited English proficiency	Binary
	Immigrant	Student is classified as an immigrant	Binary
	Migrant	Student is classified as a migrant	Binary
	Ever pregnant	Student was pregnant in any previous year	Binary
	Student racial majority	Majority of students on the campus are of the student's race	Binary
	Teacher racial majority	Majority of teachers on the campus are of the student's race	Binary
	Number of schools attended	Number of schools the student attended in the year	Continuous

Draft: Not for circulation or citation without the consent of the author(s)

## Appendix II-Methods

Since the outcome variables of interest, grade retention and school dropout, are dichotomous variables, binomial logit represents a more appropriate methodology for assessing relationships than Ordinary Least Squares (OLS) regression. OLS was rejected due to a tendency towards heteroscedasticity and the production of impossible results when faced with dichotomous variables (Greene, 2003; Gujarati, 1995; Long, 1997).

Users of binomial logit often indicate the effect of an independent variable using odds-ratios. This has some benefits in that it provides an intuitive method for interpretation. However, odds ratios do not calculate a specific probability that a student will experience grade retention or high school dropout with and without exposure to school discipline sanctions. Both of these values are needed in order to calculate the economic effects of grade retention/ dropout associated with discipline. The most straight-forward approach, then, is to calculate the change in the probability of the outcome of interest that occurs with the presence of school discipline.<sup>6</sup>

A first step is to calculate the chance a student will be retained or dropout. In order to assign probabilities, a specific value must be assigned to each independent variable. Keeping with Long (1997), the values of all continuous variables are kept at their means, while all categorical variables are kept at their mode. Because the mode and the mean are the most commonly occurring values, the probabilities generated by a model set to these constants can be said to represent a “typical” student.

The likelihood of being retained is regressed on the number of discipline events that a student experiences in the year. In order to isolate the effect of discipline, over 80 variables that

---

<sup>6</sup>The formula to calculate the probabilities in binomial logit is:  $\Pr(y_i|x_i) = \frac{1}{1+\text{exp}(-x_i\beta)}$

have been associated with academic failure and exclusionary discipline in prior research are also controlled for in the model (Hammond et al., 2007). These variables include measures of students' academic performance, socio-economic status, racial/ethnic status, and special education placement. Further measures of the students' school environment are included as well including student/teacher ratios, campus demographics and district wealth as school-level characteristics are also believed to be important predictors of students' academic outcomes. See Appendix I for a complete list of variables included in the analysis.

Results of logistic regression analyses were used to identify the difference in dropout/retention rates for students who were disciplined relative to students who did not have any school disciplinary contact. In order to quantify the economic effects of exclusionary discipline, an economic value was assigned to the resulting difference in rates based upon available measures and previous economic studies.