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A Multiple Perspectives Analysis of the Influences on the School to Prison Pipeline in Virginia

Report of Quantitative Findings

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Executive Summary

In this section, we briefly review our main findings, organized by research question. Research questions 1-3 and 5 deal with school level data. For all-school level analyses that follow, we controlled for school size by calculating measures of exclusionary discipline and appearance at intake per 1000 students enrolled at the school. All references to short-term suspension, long-term suspension, one-year expulsion, permanent expulsion, and appearance at intake are per 1000 students enrolled.

RQ 1: What is the influence of school resource officers (SROs) and the related policies (i.e., memorandums of understanding (MOUs)) on student appearances at intake?

We hypothesized that schools with SROs would have higher numbers of appearances at intake for nonviolent offenses. For this part of the study, we compared schools with a full-time SRO to those that did not have a full-time SRO (although they may have had a part-time SRO, a school security officer, or some other type of security personnel). In doing the analysis, we considered three measures of appearance at intake—all appearances, discretionary appearances (appearances for offenses that were not required to be reported to law), and appearances for nonviolent offenses. When considering all appearances at intake, the numbers were significantly greater for middle and high schools which had a full-time SRO. This effect was significant for both school levels in 2013-14 and for only middle schools in 2014-15. We also found a higher rate of discretionary appearances at intake for both middle and high schools for both years. We caution against assigning causation here. In particular, it is unclear whether the presence of an SRO leads to more arrests, or if SROs are more likely to be assigned to schools with more potentially criminal behavior. We did find that both middle and high schools with full-time SROs had a significantly higher rate of appearance at intake per 1000 students for nonviolent

offenses in 2013-14. This effect weakened so that it was not significant in 2014-15. There were no meaningful differences between elementary schools with and those without a full-time SRO. This is not surprising as very few elementary schools (about 3%) have a full-time SRO and elementary schools have very few reports to law. There were also no significant differences between combined schools with and without a full-time SRO.

We anticipated that schools without memorandums of understanding (MOUs) as a guiding policy for the involvement of the SRO in discipline issues would have higher numbers of appearances at intake for nonviolent offenses than schools that did not have an MOU. We performed this analysis two ways. First, we compared all schools in districts with an MOU to all schools in districts without an MOU. Second, we compared only schools that had full-time SROs and were in districts with an MOU to schools that had a full-time SRO and were in districts without an MOU. The data did not support our hypothesis. We found no difference in appearances at intake per 1000 students in either comparison. We did find, however, that when we include all schools (regardless of SRO status), those in districts with an MOU had significantly higher rates of long-term suspensions (suspensions which lasted between 11 and 179 school days). This difference was present in elementary, middle, and high schools for both years of data. When we only included schools with a full-time SRO in the analysis, the difference disappears for elementary schools and becomes larger for both middle and high schools. Having an MOU as a guiding principle for the involvement of the SRO in the school correlates with higher rates of long-term suspensions. We also found that when we included all elementary schools, those with an MOU had significantly fewer incidents of short-term suspension. This difference did not hold when we only included schools with a full-time SRO. There were no differences in other types of exclusionary discipline.

In conclusion, middle and high school students who attend a school which has a full time SRO are more likely to appear at intake as a result of an offense that is not required to be reported to law enforcement than students who attend a school which does not have a full time SRO. Also, for middle and high schools which have a full time SRO, those with an MOU have higher rates of long-term suspensions than those without.

RQ 2: What is the effect of school safety factors on the use of exclusionary discipline and appearances at intake?

We anticipated that there would be no significant differences between schools rated as safe and unsafe in terms of either the use of exclusionary discipline or appearances at intake. Because our measures of school safety were scores from the Virginia Secondary School Climate Survey for 2013-14 (see Cornell 2016 for information on the School Climate surveys) and these scores are on a continuous scale, we declined to separate schools into two groups ("safe" and "unsafe") based on a cutoff score. Instead, we examined the correlation between the level of school safety and the number of uses of exclusionary discipline and appearances at intake. Our measure of school safety was the sum of three subscores that measured students' perceptions of gang activity, the prevalence of teasing and bullying, and personal experience of teasing and bullying. The Climate Survey was administered to high school students in 2013-14 and to middle school students in 2014-15. We have limited our analysis to high schools in 2013-14.

We found significant correlations between two of our three measures of school safety and the prevalence of exclusion from school and appearances at intake. Schools in which students perceive a higher rate of gang activity have a greater use of all types of exclusionary discipline (short-term suspensions, long-term suspensions, expulsion, and permanent expulsion) and more appearances at intake. We also found this pattern for schools in which students perceive that

incidents of teasing and bullying are more frequent. The higher the prevalence of teasing and bullying, the higher the rate of all types of exclusionary discipline and appearances at intake. We did not find a significant correlation between student's personal experiences of teasing and bullying and measures of exclusionary discipline or appearance at intake.

In addition to school safety factors, we examined the relationship between zero-tolerance policies and the use of exclusionary discipline and appearance at intake. We measured the use of zero-tolerance two ways. First, we simply grouped schools into those that used their zero-tolerance policy to expel at least one student and those that did not. Second, we calculated the number of uses of zero-tolerance to expel a student per 1000 students. For this research question, we included only schools that were in districts with a zero-tolerance policy.

We anticipated that schools that utilized a zero-tolerance policy would have greater rates of exclusionary discipline use and appearance at intake. We found that elementary and middle schools that had used their zero-tolerance policy during 2013-14 had rates of short-term suspensions that were almost twice as high as schools that had not used their zero-tolerance policy. We also found that elementary, middle, and high schools that used their zero-tolerance policy to expel students had significantly higher rates of one-year expulsion. However, we found no differences in permanent expulsion based on zero-tolerance policy use. We also found no differences for long-term suspensions or appearances at intake.

We anticipated that schools with greater rates of zero-tolerance policy use would have greater rates of exclusionary discipline use and appearances at intake. We found a small, but significant, positive correlation between use of zero-tolerance and short-term suspension for elementary and middle schools. The more frequently these schools had used their zero-tolerance policy, the more frequently they had used short-term suspension. We also found a small, but

significant, positive correlation between zero-tolerance use and long-term suspension rates for elementary schools. The more frequently they used their zero-tolerance policy, the higher their long-term suspension rate. There were strong, positive correlations between the use of zero-tolerance and one-year expulsions for elementary, middle, and high schools. This is not surprising as each use of a zero-tolerance policy results in some type of expulsion and expulsions are rare events. There was no correlation between the frequency of zero-tolerance use and permanent expulsions. Finally, there was a small, but significant, positive correlation between the use of zero-tolerance and appearances at intake for high schools.

RQ 3: What is the relationship between school climate and the use of exclusionary discipline and student appearances at intake?

Our measures of school climate come from the student responses to the 2013-14 School Climate Survey. Because the survey was administered only to high school students in this year, our findings are limited to high schools. We considered schools that had more disciplinary structure, greater student engagement and greater student support to have a more positive climate. We anticipated that there would be strong negative correlations between school climate and the use of exclusionary discipline and appearances at intake. We found small to medium negative correlations between school climate and all four measures of exclusionary discipline and appearances at intake. Schools with less positive climates had higher uses of short-term and long-term suspension, of both yearlong and permanent expulsion, and of appearances at intake.

RQ 4: What are the influences of cultural factors on the STPP in Virginia?

We anticipated that incidents of exclusionary discipline and appearances at intake would be higher among minority students and among students with an IEP. We considered students in

specific groups—for instance, Hispanic, female, without an IEP and Asian, male, with an IEP . We found that black male students with an IEP are the most likely students both to appear in the DCV data set and to go to the intake officer at all school levels with an odds ratio of more than 1.5 times the next highest group. However, if we consider only those students who have committed an offense, then black male students with an IEP are no more likely to appear at intake than other groups of students. The overrepresentation of black male students with an IEP occurs when they are entered into the DCV data set, i.e. their offenses cases are reported as the official records that went to the Virginia Department of Education (VDOE). This could mean that these students actually take more actions which warrant these charges, or it could mean that when these students take similar actions to other students, they are more likely to be charged with an offense. Further study is needed to determine if one or both of these explain our results.

We also anticipated that minority students and those with an IEP would receive more school days of suspension than other students. We found that when controlling for violent offenses and those that were required to be reported to law enforcement, black students receive the greatest number of school days of suspension and Asian students receive the fewest. It is possible that the offenses differ in other ways and that these unaccounted for differences are the cause. However, taken with the results of the first paragraph, these results deserve further research. We also found that students with an IEP receive fewer school days of suspension than students without an IEP. This is not surprising as the state puts limits on the exclusionary discipline assigned to students with an IEP.

RQ 5: To what extent do each of the influences of school climate, school safety, threat assessment, and cultural background contribute to the STPP in Virginia?

We anticipated that an ecological model of influences at the school level would include effects from school safety, school climate, threat assessment, and cultural background. This analysis was done for high school for the 2013-14 school year. We found a direct effect of the use of exclusionary discipline on on-time graduation rate and appearance at intake. The greater the use of exclusionary discipline, the lower the on-time graduation rate and the greater the rate of appearance at intake. Controlling for the proportion of disadvantaged students, for the proportion of minority students in schools, and for the presence of a full-time SRO, a zero-tolerance policy, and an MOU, schools with higher proportion of students with an IEP and with lower pass rate of English SOL tests were more likely to appear at intake.

Quantitative Findings

Introduction

We have organized our findings as follows. It was critically important to determine a consistent and reliable method for determining which students actually became involved with the juvenile justice system. In Virginia, juvenile Intake Officers serve in a magisterial role, and they have a great deal of discretion in terms of what actually proceeds to court. Any charge that will appear before a court will begin as a petition at intake, and if the Intake Office finds probable cause they can issue a petition and/or a detaining order. Alternatively, with any charge, the Intake Officer can choose to handle the charge informally by, taking the charge under advisement, requiring treatment, requiring community service, and the like. We determined that an appearance before the intake officer, whether a charge was filed or not, was the beginning point of the juvenile justice process. In our first section, "Identifying Which Students Appeared at Intake," we describe the process of determining which incidents in schools result in a student being referred to the juvenile justice system. Second, we list our research questions and findings by question. We began the project with five general research questions. In order to investigate the first four questions in greater detail, we wrote more specific research questions. For instance, we divided Research Question 1 into two parts which we labeled Research Question 1A and Research Question 1B. The report for each question is divided into subsections. First, we state the general research question. Second, we describe the origins of the variables we used to answer the question along with descriptive statistics for each variable. Third, we provide a description of our data analysis methods. Fourth, we state our more specific research questions and hypotheses

along with any additional variables needed to answer the question and the results of our data analysis.

Identifying Which Students Appeared at Intake

Before we conducted any analysis of the Discipline Crime and Violence (DCV) or department of juvenile Justice (DJJ) Intake datasets, we needed to mask any potentially identifiable information. Because these two data sets used entirely different systems to identify unique individuals, the student identification or subject identification numbers we're only useful to identify who were unique individuals within the datasets, and who appeared multiple times within the datasets. They were not useful in connecting the two data sets. As a result, we ran deleted any names provided (DJJ only), and each identifying unique ID number through a hash algorithm. The hash algorithm replaced the actual ID number with a newly generated 24-character code which hides the identity of the individual, but retains the uniqueness. Inputting the same ID number will generate the same output, so we can identify the individuals who are entered in the datasets multiple times. We did not retain the hash, there is no way to reverse the process and discover the ID number, thereby identifying the indiviudal.

The most difficult problem for us in doing this analysis was determining how frequently incidents that began in schools ended up in the juvenile justice system. For this study, we defined the beginning of a student's involvement in the juvenile justice system as when they appear before the intake officer. Therefore, we named our measure of whether students were in the juvenile justice system "appearance at intake." In order to find out who ended up appearing at intake, we had to match cases and students between two data sets. One had information about students and offenses which appeared at intake, but no information about whether the offense

occurred in school. The other had information about students and disciplinary incidents which occurred in schools, but no reliable indication of whether the student appeared at intake.

We began our study with multiple sources of data—records of juveniles who entered the juvenile justice system (Department of Juvenile Justice (DJJ) data set), records of students who committed selected disciplinary offenses at school or school-related events (Discipline, Crime, and Violence (DCV) data set), school level data from the Virginia School Safety Audit, school level demographic and offense data from the Office of Civil Rights (OCR), school level demographic and testing data from the Virginia Department of Education (VDOE), and individual level data from the Virginia Secondary School Climate Survey. The first two data sets (DJJ and DCV) were the ones which needed to be matched. The remaining data sets were used to create other variables needed to answer our research questions.

Although the DCV data set includes a checkbox for schools to indicate that the case was reported to law enforcement, we found that the term "report to law enforcement" did not necessarily indicate that the student has appeared at intake. In fact, very few of the students for whom this box was checked ended up appearing before the intake officer. The term "report to law enforcement" had different meanings for different stakeholders, and discretionary referrals are interpreted differently. In addition, the checkbox is populated based upon the incident, not the individual, and may include multiple checkmarks per incident. For example, one incident may include two students (e.g. fighting) and several discipline infractions (e.g. one of the students may be found to have a knife and marijuana). That student is subsequently referred to juvenile justice for the more serious infractions. However, each secondary incident is listed, and populated as "Reported to Law Enforcement" in the DCV dataset (e.g. one checkmark for the knife, one for the marijuana, and one for fighting), and even the student who did ***not*** appear

before an intake office receives a checkmark, because he/she was involved in the incident. In this example, one student is referred to intake, but four checkmarks appear in the DCV dataset. Therefore, the checkbox is not a reliable measure of numbers of students who end up in Virginia's juvenile justice system. We do know that all incidents which end up in the juvenile justice system are reported in the DJJ data set. Our problem was to determine which of these cases (those in the DJJ data set) began in school. To do this, we looked for cases that were reported by schools (in the DCV data set) which also appeared in the DJJ data set.

Matching these data sets was not straightforward. For school level data, we found that different state organizations use different identifiers for the same school and that some of the online information available to schools (such as which school number to enter for the school safety survey) is outdated. For the individual level (DCV and DCJS) data, we had no common student identifier. When schools create and submit DCV data, they create their own local number to identify each student. Some schools start with number one for the first student who commits an offense and count up for each subsequent offender. Other schools appear to use a school-assigned student number in their data. The DJJ data have student identifiers which do not match numbers used by the schools. Because none of these numbers match, we needed to identify elements which would be common to both data sets and, therefore, could be used to match cases.

We ended up using a combination of demographic and offense data to match cases. Both the DCV and DJJ data sets contain gender, race, offense category, and incident date for each case. However, DCV and DJJ use different codes to describe the same offense. We created a common set of offense categories to use in matching. A table linking both sets of offense codes to our offense categories appears in Appendix A. In addition, each case in the DJJ data set includes age at intake and the Federal Information Processing Standards (FIPS code). We created

an age variable in the DCV set by computing the difference between birth date and offense date, two variables that were in DCV. We also added the FIPS code to each case in the DCV data set. Because both FIPS codes and most school systems in Virginia are county- or city-wide, we assigned FIPS codes based on the school division in which the offense occurred.

Once these variables were computed, we created a database using Microsoft Access into which we entered both data sets. We then matched the two on gender, race, FIPS code, offense category, age and incident date. We set the matching to be exact for the first four criteria, but allowed it to vary by a maximum of one year for age and by up to four days for incident date to account for data entry errors. We would prefer false positives (a match for a student who was not charged) as opposed to missing a match because the date of the offense was entered incorrectly.

Matching based on these criteria resulted in 10,668 matches. Most of these were not unique. The matches contained 6779 unique persons from DCV and 6320 unique persons from DJJ some of which had more than 10 matches. We eliminated multiple matches case-by-case starting with those which had the greatest number of matches. To do this, we examined each DCV case with multiple matches and looked to see if one of the matched DJJ cases was best (i.e. exact match for age and incident date). If it was, we kept this match and eliminated the others. We then reversed the process and examined each DJJ case with many matches in the same way. For many incidents, students are charged with more than one offense. For instance, a student who gets in a fight may be charged with both fighting and defying authority if he refuses to stop when asked. In the DCV data set (which provides the option of entering up to two secondary offense codes in addition to the primary code) such an incident would have one primary entry. In the DJJ set (which has a separate entry for each charge that results from an incident) the same incident would have two separate entries. This resulted in multiple matches for the same person

and incident date. We identified cases for which this was true and counted each as only one match. Ultimately, we found 5705 unique matches—3017 for 2013-14 and 2688 matches for 2014-15. We named each match an "appearance at intake." The rate of appearances at intake is 2.3 per 1,000 students, which is significantly less than the 15.8 per 1,000 which are reflected by the checkbox "reported to law enforcement".

We recognize that our matches may include some false positives. One possible source of error is our expansion of the matching criteria for age and incident date. While allowing larger differences in these criteria to count as a match might increase the number of matches, we already see few matches at the larger gaps with 329 unique matches with a four-day difference in incident date and only 50 matches with more than a 0.8 year difference in age. A second possible error source is that, in the case of multiple matches based on identical criteria, we made a choice about which case to include and which to eliminate. Although this does not affect our total number of matches, it may have resulted in errors when data were aggregated to a particular school.

Key Findings

Research Question 1: What is the influence of school resource officers (SROs) and the related policies on student appearances at intake?

Variables and Descriptive Statistics for Research Question 1

The influence of SROs and the related district-level policies were measured in a variety of ways. First, data on the presence of SROs was obtained from the Virginia School Safety Audit. Some schools employ school security officers (SSOs) or private security officers instead of SROs. For our analysis, we counted only schools with full-time SROs as having an SRO.

Schools with SSOs, private security officers, or part-time officers of any type were counted as not having an SRO. In the rest of this report, schools with SROs indicate only schools with full-time SROs.

Second, "related policies" are represented by memorandums of understanding (MOUs). Many school districts have an MOU with the local law enforcement agency which may describe what roles the SRO will play in the school. We collected data on the existence of MOUs for each school district by contacting the district and requesting a copy of the MOU. There are a total of 132 school districts in Virginia. There were 21 districts which did not respond to our request. These districts contained a total of 166 schools. This means that we have two independent variables: the presence of an SRO and the existence of an MOU, and two specific research questions. We have arranged the results section by research question.

Third, we defined student appearances at intake as cases which started in the school and for which the student met with an intake officer of the juvenile justice system. These cases were found through the data matching process described in the previous section. We were particularly interested in both nonviolent offenses that were referred and cases that were referred even though referral was not required by the Virginia state code because. We selected for these cases. A list of violent and nonviolent offenses can be found in Appendix B. Schools in Virginia have widely different enrollment numbers and this needs to be accounted for. For instance, it is reasonable to assume that larger schools will have more offenses occur simply because there are more students to commit an offense. In order to control for this effect, we calculated the number of cases that went to an intake officer per 1000 students in the school. (Although it may make sense to think of a per capita rate for offenses, those numbers were very small. Calculating the rate per 1000

students made the numbers easier to compare even though many schools in Virginia have fewer than 1000 students enrolled.)

Finally, because both the presence of a full-time SRO and the number of appearances at intake vary widely by school level (see Table 1), we analyzed data by school level—elementary, middle, high, and combined. Combined schools are those schools that include a range of grades that crosses traditional school level boundaries (e.g. grades 1-8 or grades 7-12). We excluded schools coded "99999" in the School Safety Audit (alternative schools, Governor's schools, DJJ/Correctional Schools, etc.), schools classified as Pre-K, special education, or alternative, and adult education centers from this school level analysis. Although we included information for all schools considered together, these results should be interpreted cautiously. Neglecting to disaggregate the data by school level magnifies the difference between schools with and schools without a full-time SRO. There are many more elementary schools without an SRO than all middle and high schools combined and few of these elementary schools have appearances at intake. This combination of a large number of schools which have few appearances has an outsized effect on the overall rate of appearances for schools without a full-time SRO and magnifies the difference between schools with and without SROs as can be seen in Table 1.

Methods for Questions 1A and 1B

For each of the research questions, we compared group means using independent sample t-tests with bootstrapping (simple structure and 1000 bootstrapped samples).

Question 1A: Will schools with SROs have higher numbers of appearances at intake for nonviolent offenses?

Hypothesis 1A: We anticipate that schools with SROs will have higher numbers of appearances at intake for nonviolent offenses.

Results for Question 1A

Table 1 shows the results for comparing appearances at intake and exclusionary discipline in schools with and without an SRO. At the elementary level, there were no meaningful differences between schools with and schools without a full-time SRO. For 2013-14, the difference in the mean number of students who went to the intake officer per 1000 was slightly higher for schools with an SRO, but this difference was too small to be significant. For 2014-15, there were no appearances in elementary schools with an SRO and few appearances in schools without an SRO. While this anomaly results in statistical significance for the difference between these schools and those without an SRO, the significance is a fluke. If there were even one case of a student being referred in a school with an SRO, the statistical significance would disappear. For this reason, the difference is not meaningful.

Table 1. *Appearances in schools with and without an SRO*

Hypothesis 1A: 2013-14 School Year						
School Level	Overall Appearances per 1000		Discretionary Appearances per 1000		Nonviolent Appearances per 1000	
	Full-time SRO? Mean (SD)	Difference	Full-time SRO?	Difference	Full-time SRO?	Difference

			(Effect size)						
All Schools (N=1800)	No (N=1207, 67.1%)	.29 (1.31)	***4.72**** ***d=.80***	No	.06 (.49)	***1.58**** ***d=.54***	No	.13 (.73)	***2.26***** ***d=1.00***
	Yes (N=593, 32.9%)	5.01 (10.15)		Yes	1.64 (5.03)		Yes	2.39 (3.79)	
Elementary (N=1093, 60.7%)	No (N=1060, 97.0%)	.05 (.36)	.11	No	.01 (.20)	.09	No	.02 (.23)	.09
	Yes (N=33, 3.0%)	.16 (.51)		Yes	.10 (.40)		Yes	.11 (.43)	
Middle (N=337, 18.7%)	No (N=86, 25.5%)	2.40 (3.43)	***1.80**** ***d=.37***	No	.53 (1.43)	***1.04**** ***d=.37***	No	.99 (1.86)	***.57**** ***d=.25***
	Yes (N=251, 74.5%)	4.20 (5.29)		Yes	1.57 (3.18)		Yes	1.57 (2.49)	

High (N=306, 17%)	No (N=23, 7.5%)	3.25 (3.32)	***2.72**** ***d=.38***	No	.58 (1.50)	***1.12**** ***d=.29***	No	1.84 (2.42)	***1.55**** ***d=.40***
	Yes (N=283, 92.5%)	5.97 (7.29)		Yes	1.71 (3.98)		Yes	3.39 (3.94)	
Combined (N=64, 3.6%)	No (N=38, 59.4%)	.41 (1.21)	8.19	No	.00 (.00)	3.47	No	.19 (.82)	2.18
	Yes (N=26, 40.6%)	8.60 (38.71)		Yes	3.47 (17.67)		Yes	2.37 (8.78)	

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Note: Significant differences are shown in bold and italicized.

Table 1. *Appearances in schools with and without an SRO (Continued)*

Hypothesis 1A: 2014-15 School Year									
All Schools	No	.38 (1.75)	***3.91**** *****	No	.07 (.46)	***1.09***** ***d=.57***	No	.20 (1.25)	***1.96***** ***d=.78***

(N=1807)	(N=1235, 68.3%)		***d=.80***						
	Yes (N=572, 31.7%)	4.3 (6.66)		Yes	1.16 (2.66)		Yes	2.16 (3.31)	
Elementary (N=1100, 60.9%)	No (N=1067, 97.0%)	.06 (.42)	***-.06**** ***d=.20***	No	.02 (.19)	***-.02**** ***d=.12***	No	.03 (.32)	***-.03**** ***d=.15***
	Yes (N=33, 3.0%))	.00 (.00)		Yes	.00 (.00)		Yes	.00 (.00)	
Middle (N=336, 18.6%)	No (N=93, 27.7%)	2.55 (3.91)	***1.11**** ***d=.25***	No	.47 (1.15)	***.69**** ***d=.31***	No	.97 (2.14)	.47
	Yes (N=243, 72.3%)	3.67 (4.92)		Yes	1.16 (2.94)		Yes	1.44 (2.10)	
High (N=307, 17.0%)	No (N=38, 12.4%)	4.19 (5.41)	1.02	No	.58 (1.28)	***.74**** ***d=.39***	No	3.03 (5.21)	-.01

	Yes (N=269, 87.6%)	5.21 (5.13)		Yes	1.32 (2.34)		Yes	3.02 (3.34)	
Combined (N=64, 3.5%)	No (N=37, 57.8%)	.30 (.81)	5.71	No	.09 (.43)	.76	No	.23 (.73)	2.57
	Yes (N=27, 42.2%)	6.01 (20.91)		Yes	.86 (3.97)		Yes	2.80 (8.10)	

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Note: Significant differences are shown in bold and italicized.

Question 1B: Will schools with MOUs have higher numbers of appearances at intake for nonviolent offenses?

> *Hypothesis 1B: We anticipate that schools without MOUs as a guiding policy for the involvement of the SRO in discipline issues will have higher numbers of appearances than those schools that have an MOU.*

Additional Variables and Descriptives for Question 1B

To remain consistent with Hypothesis 1A, we chose only nonviolent offenses for this analysis. We were unable to obtain data about the existence of an MOU with local law enforcement for some districts. Schools in these districts were excluded from this part of the

analysis. Table 2 shows the number of schools in each group. The number of schools with a full-time SRO in a district without an MOU is very small compared to the total for all school levels.

In addition to appearances at intake, we also compared schools on exclusionary discipline. Data on exclusionary discipline come from the Discipline, Crime, and Violence (DCV) data set provided by the Virginia Department of Education (VDOE). We used four measures of exclusionary discipline: short-term suspensions, long-term suspensions, 365-day expulsions, and permanent expulsions. All short-term suspensions (suspensions lasting between one and 10 days) were counted equally as were all long-term suspensions (suspensions lasting between 11 and 364 days). We expect schools with more students to have more instances of exclusionary discipline simply because there are more students to commit offenses. We controlled for this by calculating the number of suspensions/expulsions per 1000 students as our dependent variable.

Table 2. *MOU status for schools by school level and SRO status*

School Level	Year	All Schools				Schools with FT SRO			
		Total	MOU (%)	No MOU (%)	Unsure (%)	Total	MOU (%)	No MOU (%)	Unsure (%)
Elementary	2013-14	1093	943 (86.3%)	55 (5.0%)	95 (8.7%)	33	27 (81.8%)	4 (12.1%)	2 (6.1%)
	2014-15	1100	947 (86.1%)	56 (5.1%)	97 (8.8%)	33	27 (81.8%)	2 (6.1%)	4 (12.1%)
Middle	2013-14	337	283 (84.0%)	22 (6.5%)	32 (9.5%)	251	213 (84.7%)	14 (5.6%)	24 (9.6%)
	2014-15	336	281 (83.6%)	22 (6.5%)	33 (9.8%)	243	207 (85.2%)	13 (5.3%)	23 (9.5%)
High	2013-14	306	251 (82.0%)	26 (8.5%)	29 (9.5%)	283	237 (83.7%)	23 (8.1%)	23 (8.1%)
	2014-15	307	253 (82.4%)	26 (8.5%)	28 (9.1%)	269	230 (85.5%)	18 (6.7%)	21 (7.8%)

Combin ed	2013 -14	64	46 (71.2%)	8 (12.5%)	10 (15.6%)	26	22 (84.6%)	3 (11.5%)	1 (3.8%)
	2014 -15	64	46 (71.9%)	8 (12.5%)	10 (15.6%)	27	24 (88.9%)	2 (7.4%)	1 (3.7%)

Results for Question 1B

Table 3 lists differences in exclusionary discipline and appearances at intake per 1000 for all schools and Table 4 lists the same statistics for only schools which have a full-time SRO. MOUs are district-wide agreements and not all schools in districts which have an MOU have a full-time SRO. Some of these schools may have a part-time SRO, some may have a full- or part-time School Security Officer (SSO), and others may have neither. Because the purpose of the MOU is to define the role of the SRO in the school, it makes sense to consider only those schools which have an SRO as part of the analysis.

We found no significant difference in the mean number of either discretionary or nonviolent appearances at intake per 1000 students between schools with and without an MOU. The existence of an MOU had no effect on the number of appearances at intake. When considering all schools (regardless of SRO status) we see two significant effects. First, there are fewer short-term suspensions per 1000 in elementary schools with full-time SROs than in those without SROs. This difference is -17.22 (p = 0.049, CI = [-34.32, -0.11], d = .22) for 2013-14 and -20.79 (p = 0.020, CI = [-38.72, -4.19], d = .23) for 2014-15. This difference disappears, however, when we consider only schools with an SRO. We also found higher incidents of long-term suspension per 1000 in elementary, middle, and high schools with an MOU. For

elementary schools, the difference is .21 (p = 0.012, CI = [0.07, 0.32], d = .18) for 2013-14 and .27 (p = 0.002, CI = [0.11, 0.41], d = .23) for 2014-15. Again, this difference disappears when we consider only schools with an SRO. This contrasts with both middle and high schools for which the higher rates of long-term suspension are significant for all schools and only schools with a full-time SRO. For 2013-14, the difference is 3.88 (p = 0.001, CI = [-5.04, -2.71], d = .51) for all middle schools compared to 4.47 (p = 0.001, CI = [-5.84, -3.21], d = .58) for middle schools with an SRO, and 2.52 (p = 0.017, CI = [-4.41, -0.34], d = .32) for all high schools compared to 3.01 (p = 0.016, CI = [-5.15, -0.62], d = .38) for high schools with an SRO. For 2014-15, the difference is 4.12 (p = 0.001, CI = [2.85, 5.38], d = .57) for all middle schools compared to 4.99 (p = 0.001, CI = [3.35, 6.79], d = .63) for middle schools with an SRO, and 3.36 (p = 0.001, CI = [2.00, 4.63], d = .53) for all high schools compared to 3.77 (p = 0.001, CI = [2.15, 5.29], d = .59) for high schools with an SRO. Compared to high schools and middle schools, very few elementary and combined schools have a full-time SRO. This difference probably accounts for some of the differences we see in the analysis.

Table 3. *Appearances at intake and exclusionary discipline by MOU status—All schools*

School Level	MOU?	Overall Appearance at Intake per 1000	Discretionary Appearance at Intake per 1000	Nonviolent Appearance at Intake per 1000	Short Term Suspension per 1000	Long Term Suspension per 1000	365-day Expulsion per 1000	Permanent Expulsion per 1000
Hypothesis 1B: 2013-14 School Year—All Schools Regardless of SRO Status								
All Schools	No (N=267)	2.19 (4.41)	.78 (2.41)	1.14 (2.66)	127.51 (165.57)	1.08 (3.48)	.31 (1.02)	.06 (.43)
	Yes (N=1510)	1.77 (6.61)	.54 (3.08)	.82 (2.45)	106.28 (171.16)	2.36 (9.02)	.25 (1.56)	.06 (.43)
	Difference	-.41	-.24	-.31	-21.23	***1.28**** ***d=.15***	-.06	.00
Elementary	No (N=144)	.12 (.60)	.04 (.42)	.04 (.27)	66.09 (99.99)	.12 (.65)	.09 (.82)	.01 (.12)
	Yes (N=936)	.04 (.31)	.01 (.15)	.02 (.23)	48.88 (72.57)	.33 (1.19)	.01 (.15)	.02 (.19)

	Difference	-.08	-.03	-.02	***-17.22** d=.22*	***.21**** *d=.18*	-.08	.01
Middle	No (N=52)	4.80 (6.02)	1.88 (3.50)	2.27 (3.62)	250.69 (238.64)	1.17 (2.42)	.32 (.81)	.06 (.47)
	Yes (N=280)	3.50 (4.59)	1.15 (2.55)	1.27 (2.02)	226.38 (235.09)	5.05 (8.25)	.31 (.93)	.10 (.55)
	Difference	-1.30	-.73	-1.00	-24.31	***3.88**** *d=.51*	-.01	-.04
High	No (N=53)	5.73 (5.46)	1.97 (3.56)	3.25 (3.67)	191.71 (156.20)	3.66 (6.62)	.89 (1.43)	.21 (.81)
	Yes (N=248)	5.76 (7.46)	1.57 (3.96)	3.24 (3.91)	177.15 (143.22)	6.18 (8.05)	.91 (1.80)	.18 (.76)
	Difference	.03	-.40	.00	-14.56	***2.52**** *d=.32*	.02	-.03
Combined	No (N=18)	.71 (1.75)	.00 (.00)	.43 (1.11)	73.99 (71.54)	.92 (2.37)	.23 (.96)	.00 (.00)
	Yes (N=46)	4.92 (29.16)	1.96 (13.28)	1.32 (6.66)	161.26 (478.24)	6.85 (41.09)	1.18 (7.31)	.06 (.43)
	Difference	4.21	1.96	.89	87.27	5.93	.95	.06

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Table 3. *Appearances at intake and exclusionary discipline by MOU status—All schools*

School Level	MOU?	Overall Appearance at Intake per 1000	Discretionary Appearance at Intake per 1000	Nonviolent Appearance at Intake per 1000	Short Term Suspension per 1000	Long Term Suspension per 1000	365-day Expulsion per 1000	Permanent Expulsion per 1000
Hypothesis 1B: 2014-15 School Year—All Schools Regardless of SRO Status								
All Schools	No (N=280)	1.66 (3.48)	.51 (1.88)	.89 (2.13)	131.81 (168.94)	.71 (2.07)	.21 (1.15)	.07 (.43)
	Yes (N=1527)	1.61 (4.56)	.40 (1.57)	.81 (2.35)	104.33 (165.32)	2.31 (9.49)	.29 (1.61)	.09 (.62)
	Difference	-.05	-.12	-.08	***-27.48* d=.16***	***1.60*** d=.23***	.08	.02
Elementary	No (N=153)	.09 (.62)	.02 (.24)	.07 (.57)	71.11 (100.01)	.11 (.70)	.00 (.00)	.00 (.00)
	Yes (N=947)	.05 (.37)	.02 (.18)	.03 (.25)	50.32 (78.46)	.38 (1.50)	.01 (.19)	.02 (.26)

	Difference	-.04	.00	-.04	***-20.79** d=.23*	***.27**** *d=.23*	***.01** *d=.07*	.02
Middle	No (N=55)	3.15 (4.36)	1.12 (3.08)	1.47 (2.52)	261.68 (246.12)	.83 (2.02)	.17 (.64)	.12 (.51)
	Yes (N=281)	3.40 (4.75)	.94 (2.49)	1.28 (2.03)	212.84 (215.47)	4.95 (10.02)	.50 (1.57)	.13 (.58)
	Difference	.25	-.18	-.19	-48.84	***4.12***** *d=.57*	***.33**** *d=.28*	.01
High	No (N=54)	4.97 (4.68)	1.40 (2.60)	2.83 (3.18)	196.69 (157.16)	2.06 (3.43)	.82 (2.37)	.26 (.81)
	Yes (N=253)	5.11 (5.27)	1.20 (2.17)	3.06 (3.70)	176.15 (155.18)	5.42 (8.36)	1.01 (2.77)	.32 (1.26)
	Difference	.14	-.20	.23	-20.54	***3.36***** *d=.53*	.19	.07
Combined	No (N=18)	.59 (1.17)	.21 (.64)	.25 (.73)	56.34 (49.27)	1.43 (2.65)	.27 (1.16)	.00 (.00)
	Yes (N=46)	3.54 (16.17)	.50 (3.05)	1.73 (6.31)	56.34 (49.27)	8.86 (42.09)	.75 (4.87)	.07 (.46)

	Difference	2.95	.29	1.48	102.08	7.43	.48	.07

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Table 4. *Appearances at intake and exclusionary discipline by MOU status—Schools with FT SRO*

Hypothesis 1B: 2013-14 School Year—Only Schools with Full-time SROs								
School Level	MOU?	Overall Appearance at Intake per 1000	Discretionary Appearance at Intake per 1000	Nonviolent Appearance at Intake per 1000	Short Term Suspension per 1000	Long Term Suspension per 1000	365-day Expulsion per 1000	Permanent Expulsion per 1000
All Schools	No (N=90)	5.47 (6.03)	2.06 (3.72)	2.87 (3.83)	213.27 (200.81)	2.18 (5.26)	.50 (1.05)	.11 (.61)
	Yes (N=494)	4.91 (10.78)	1.54 (5.22)	2.30 (3.78)	198.25 (238.30)	6.01 (14.69)	.70 (2.63)	.12 (.60)
	Difference	-.56	-.52	-.57	-15.02	***3.83**** ***d=.28***	.20	.01
Elementary	No (N=6)	.00 (.00)	.00 (.00)	.00 (.00)	84.41 (48.15)	.00 (.00)	.00 (.00)	.00 (.00)

	Yes (N=26)	.20 (.57)	.13 (.45)	.14 (.48)	55.91 (67.72)	.08 (.40)	.00 (.00)	.00 (.00)
	Difference	.20	.13	.14	-28.50	.08	.00	.00
Middle	No (N=36)	6.08 (6.66)	2.57 (4.01)	2.77 (4.12)	263.87 (256.64)	.93 (2.25)	.34 (.83)	.00 (.00)
	Yes (N=212)	3.82 (4.83)	1.33 (2.77)	1.38 (2.06)	231.49 (241.57)	5.40 (8.3)	.36 (1.03)	.10 (.56)
	Difference	-2.25	-1.24	-1.39	-32.38	***4.47**** ***d=.58***	.02	.10
High	No (N=44)	6.03 (5.73)	2.12 (3.79)	3.51 (3.81)	200.26 (152.76)	3.45 (6.95)	.73 (1.25)	.22 (.87)
	Yes (N=234)	5.95 (7.61)	1.66 (4.05)	3.33 (3.97)	181.12 (145.12)	6.46 (8.18)	.91 (1.77)	.16 (.66)
	Difference	-.08	-.46	-.18	-19.14	***3.01**** ***d=.38***	.18	-.06
	No	2.17	.00	.93	94.24	2.79	.00	.00

Combined	(N=4)	(2.92)	(.00)	(1.20)	(64.56)	(4.08)	(.00)	(.00)
	Yes (N=22)	9.77 (42.11)	4.10 (19.21)	2.63 (9.54)	228.40 (683.58)	14.08 (59.26)	2.47 (10.54)	.13 (.62)
	Difference	7.60	4.10	1.70	134.16	16.29	2.47	.13

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Table 4. *Appearances at intake and exclusionary discipline by MOU status—Schools with FT SRO*

Hypothesis 1B: 2014-15 School Year—Only Schools with Full-time SROs								
All Schools	No (N=84)	4.13 (4.49)	1478 (3.13)	2.04 (2.44)	210.68 (217.12)	1.22 (2.72)	.39 (1.30)	.19 (.61)
	Yes (N=488)	4.32 (6.97)	1.10 (2.57)	2.19 (3.44)	192.96 (238.13)	5.83 (15.81)	.74 (2.60)	.24 (1.01)
	Difference	.20	-.36	.15	-17.72	***4.60**** ***d=.41***	.35	.05
Elementary	No (N=6)	.00 (.00)	.00 (.00)	.00 (.00)	30.52 (26.42)	.00 (.00)	.00 (.00)	.00 (.00)
	Yes (N=27)	.00 (.00)	.00 (.00)	.00 (.00)	38.78 (38.90)	.05 (.27)	.08 (.42)	.00 (.00)
	Difference	.00	.00	.00	8.26	.05	.08	.00
Middle	No (N=36)	3.46 (4.20)	1.45 (3.67)	1.39 (2.05)	267.74 (275.51)	.71 (1.91)	.18 (.63)	.18 (.63)

	Yes (N=207)	3.71 (5.05)	1.11 (2.80)	1.45 (2.11)	225.37 (240.41)	5.70 (10.99)	0.52 (1.66)	.17 (.67)
	Difference	.25	-.34	.06	-42.38	***4.99**** ***d=.63***	**.34*** ***d=.27***	-.01
High	No (N=39)	5.60 (4.65)	1.79 (2.91)	3.11 (2.56)	196.48 (151.01)	1.75 (3.37)	.68 (1.77)	.24 (.67)
	Yes (N=230)	5.15 (5.22)	1.24 (2.23)	3.00 (3.46)	178.15 (158.56)	5.52 (8.45)	.94 (2.67)	.36 (1.32)
	Difference	-.46	-.54	-.10	-18.32	***3.77**** ***d=.59***	.26	.11
Combined	No (N=3)	1.22 (2.12)	.41 (.71)	.00 (.00)	71.00 (62.44)	2.95 (3.06)	.00 (.00)	.00 (.00)
	Yes (N=24)	6.61 (22.15)	.91 (4.21)	3.15 (8.55)	228.81 (624.56)	16.35 (57.81)	1.44 (6.74)	.00 (.00)
	Difference	5.39	.51	3.15	157.81	13.40	1.44	.00

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Research Question 2: What is the effect of school safety factors on the use of exclusionary discipline and appearances at intake?

Variables and Descriptive Statistics for Research Question 2

Data on school safety come from the Virginia Secondary School Climate Survey for 2013-14 and data on the presence of school resource officers in schools come from the School Safety Audit. Both surveys are administered annually by the Virginia Center for School and Campus Safety (VCSCS) and the Virginia Department of Criminal Justice Services (DCJS) Criminal Justice Research Center. The Climate Survey is administered to students and teachers. In 2013-14, it was administered to high school students and teachers. The Safety Audit is completed by one person at each school. Typically, a school administrator responds, although occasionally the survey is answered by an SRO or administrative assistant. The questions on the survey vary from year to year. While the 2013-14 Safety Audit included items which were nearly identical to those that we used to measure school safety (from the Climate Survey), the 2014-15 Safety Audit did not. We chose to use the student, rather than teacher, data on safety and climate and to limit this analysis to high schools in the 2013-14 school year.

The 2013-14 Climate Survey included items that are easily grouped into three measures of school safety: gang activity (Gang), perceptions of teasing and bullying (PTB_P), and the experiences of teasing and bullying (PTB_E). School safety is the sum of the three subscores: Gang, PTB_P, and PTB_E. All measures were determined to be psychometrically sound. The items included in each measure along with the reliability of each are listed in Appendix C.

Instead of classifying schools as safe or unsafe, we considered the measure of safety to be on a continuous scale. Lower safety scores indicate safer than schools. The mean, minimum, and maximum scores for each measure are listed in Table 5.

Table 5. *Measures of school safety* 2013-14 high schools (N = 320)*

Measure	Mean	Min	Max
Gang	0.10	0	0.48
PTB_P	2.41	1.52	2.94
PTB_E	1.26	1.01	1.51
School Safety	3.77	2.67	4.72

**School Safety = Gang + PTB_P + PTB_E; lower scores indicate safer schools.*

Data on exclusionary discipline come from the Discipline, Crime, and Violence (DCV) data set provided by the Virginia Department of Education (VDOE). We used four measures of exclusionary discipline: short-term suspensions, long-term suspensions, 365-day expulsions, and permanent expulsions. All short-term suspensions (suspensions lasting between one and 10 days) were counted equally as were all long-term suspensions (suspensions lasting between 11 and 364 days). Schools with more students would be expected to have more instances of exclusionary discipline simply because there are more students to commit offenses. We controlled for school size by calculating the number of suspensions/expulsions per 1000 students.

For a description of how appearances at intake were measured, see the first section of this report (p. 10).

Question 2A: Will less safe schools have higher rates of the use of exclusionary discipline?

Hypothesis 2A: We anticipate that there will be no significant differences between safe schools and unsafe schools with regard to the use of exclusionary discipline.

Question 2B: Will less safe schools have higher rates of appearance at intake enforcement?

Hypothesis 2B: We anticipate there will be no difference between safe schools and unsafe schools with regard to appearance at intake enforcement.

Methods for Questions 2A and 2B

Correlations with bootstrapping were used to test the strength of the relationships between each measure of school safety and the measures of exclusionary discipline and appearances at intake. The number of samples for the bootstrap was 1000 and simple sampling was used.

Results for Questions 2A and 2B

Note: Results for question 2A and 2B are for high schools during 2013-14 only.

Table 6 lists the correlation coefficients for measures of school safety with exclusionary discipline and appearances at intake. We found weak to moderate correlations of both gang activity and the prevalence of teasing and bullying (PTB_P) with all measures of exclusionary discipline and appearances at intake. Schools in which students are more likely to report seeing evidence of gang activity in their school and to believe that other students at their school are teased or bullied have higher incidents of all four measures of exclusionary discipline as well as

greater rates of appearance at intake. The correlation coefficient between Gang Activity and: 1) short-term suspension is 0.359 ($p \leq .000$, 95% CI = [0.280, 0.551]), 2) long-term suspension is 0.285 ($p \leq .000$, 95% CI = [0.233, 0.498]), 3) 365-day expulsion is 0.218 ($p \leq .000$, 95% CI = [0.141, 0.314]), 4) permanent expulsion is 0.186 ($p = .001$, 95% CI = [0.031, 0.330]), and 5) appearance at intake is 0.257 ($p \leq .000$, 95% CI = [0.211, 0.390]). The correlation coefficient between PTB_P and: 1) short-term suspension is 0.344 ($p \leq .000$, 95% CI = [0.261, 0.539]), 2) long-term suspension is 0.162 ($p = .004$, 95% CI = [0.121, 0.334]), 3) 365-day expulsion is 0.171 ($p = .002$, 95% CI = [0.132, 0.314]), 4) permanent expulsion is 0.175 ($p = .002$, 95% CI = [0.060, 0.277]), and 5) appearance at intake is 0.176 ($p = .002$, 95% CI = [0.136, 0.362]). There is no relationship between the experience of being teased and/or bullied and rates of exclusionary discipline or appearances at intake.

Table 6. *School safety correlations with exclusionary discipline and appearances at intake (N = 320)*

Measures of School Safety/ Student	Correlations				
	Exclusionary Discipline				Appearance at Intake per 1000
	Short-term suspension per 1000	Long-term suspension per 1000	365-day expulsion per 1000	Permanent expulsion per 1000	
Overall school Safety[a]	.359**	.186**	.184**	.182**	.209**
Gang Activity[b]	.400**	.285**	.218**	.186**	.257**
PTB_P[c]	.344**	.162**	.171**	.175**	.176**
PTB_E[d]	.077	.005	.044	.054	.093

* p < .05 ** p < .01

Notes: We may use Cohen's rule of thumb for interpreting the correlation coefficient (p.83, 1988), i.e., r =0.10 small, r=0.30, medium, and r=0.50 large. This Cohen's convention looks small, but these correspond to the well-known Cohen's d (d=0.2 small, 0.5, medium, and 0.8 large)

[a] Higher scores indicate less safe schools.

[b] Higher scores indicate more perceived gang activity.

[c] Higher scores indicate higher perceived prevalence of teasing and bullying.

[d] Higher scores indicate more experiences of teasing and bullying.

Question 2C: Will schools that have zero-tolerance policies have higher rates of the use of exclusionary discipline and appearance at intake?

Hypothesis 2C: We anticipate schools that utilize a zero-tolerance policy will have a higher use of exclusionary discipline and appearances at intake than schools that do not.

Additional and Variables and Descriptives for Question 2C

For this analysis, we included only schools in systems that have a zero-tolerance policy. In order to determine whether each district had a zero-tolerance (ZT) policy, we contacted each school district and requested a copy of the district MOU which we reviewed for mention of such a policy. There are 132 school districts in Virginia. We received MOUs from 111 districts. If the MOU mentioned a ZT policy, we coded schools in the district as having one and if the MOU did not mention a ZT policy, we coded schools in the district as not having a ZT policy. Schools in districts from which we did not receive an MOU were recorded as "unsure" for having a ZT policy and were excluded from the analysis. Data on which schools utilized a zero-tolerance policy during the 2013-14 school year come from the OCR data set. There were a few schools for which the district MOU did not mention zero-tolerance or for which we did not receive a response, but the OCR data set showed that they had used a zero-tolerance policy to expel at least one student. These schools' districts were recoded to indicate the existence of a zero-tolerance policy. Possible reasons for this contradiction are: 1) the MOUs may have been more

current than the OCR data, 2) the district had an MOU with zero-tolerance but did not respond to our request, and 3) the MOU did not mention an existing zero-tolerance policy or we failed to identify it in our analysis.

Table 7 shows the number of schools that have a zero-tolerance policy at each level and Table 8 shows which of these schools expelled at least one student using zero tolerance. As shown in Table 8, the percent of schools that have a zero-tolerance policy which they use to expel at least one student during the 2013-14 school year ranges from less than 1 % of elementary schools to 33.5% of high schools. We have described the calculations we used for exclusionary discipline and appearance at intake per 1000 students in the Variables and Descriptive Statistics section for Research Question 1. Descriptives for these variables for only schools in districts with a zero-tolerance policy are shown in Table 8.

We computed two zero-tolerance measures. First, we separated schools in systems with a zero-tolerance policy into two groups—those that had utilized a zero-tolerance policy to expel a student and those that had not. Schools that had utilized a zero-tolerance policy any number of times were put in the first group and schools that had not utilized a policy for discipline in the past year were put into the second group. Second, we calculated the frequency with which schools utilized a zero-tolerance policy to expel students. For this measure, we also controlled for school enrollment because schools with more students are expected to utilize all types of discipline more frequently simply because there are more students to commit offenses. The resulting measure is the number of uses of zero-tolerance policy per 1000 students.

Methods for Question 2C

Note: Results for question 2C are for all schools during 2013-14.

Independent samples t-tests with bootstrapping (simple sampling and 1000 bootstrapped samples) were used to compare schools which used a zero-tolerance policy to expel at least one student to schools that had a zero-tolerance policy but did not use it. Schools were separated by school level based on data from the School Safety Audit. For elementary schools, 658 of 1093 schools (60.2%) were in districts with a zero-tolerance policy. For middle schools, 195 of 337 (57.9%) were in districts with a zero-tolerance policy, as were 170 of 306 high schools (55.6%), and 22 of 64 combined schools (34.4%). As shown in Table 8, the use of a zero-tolerance policy to expel students is higher for higher grades. To account for this difference, the data were analyzed by school level.

Table 7. *Existence of zero-tolerance policy by school level for 2013-14*

School Level	In district with zero-tolerance policy	In district without zero-tolerance policy	Total
Elementary	658 (60.2%)	435(39.8%)	1093 (60.7%)
Middle	195 (57.9%)	142 (42.1%)	337 (18.9%)
High	170 (55.6%)	136 (44.4%)	306 (17.0%)
Combined	22 (34.4%)	42 (65.6%)	64 (3.6%)
All Schools	1045 (58.1%)	755 (41.9%)	1800 (100%)

Table 8. *Number of uses of zero-tolerance policy per 1000 students for schools with zero-tolerance policy by school level for 2013-14*

School Level	N	Min	Max	Mean	SD	Number of schools with at least one use (Percent)
Elementary	658	.00	6.78	.04	0.45	6 (0.91%)
Middle	195	.00	20.91	.61	2.12	27 (13.8%)
High	170	.00	17.60	1.46	2.82	57 (33.5%)

Combined	22	.00	6.64	.30	1.42	1 (4.5%)
All Schools	1045	0.00	20.91	0.39	1.60	91 (8.7%)

Results for Question 2C

Differences between the schools that did and did not utilize a zero-tolerance policy are listed in Table 9 and significant differences are outlined below by grade level:

Elementary Schools: Only six of 658 elementary schools expelled at least one student based on a zero-tolerance policy. These schools had significantly higher rates of short-term suspensions and permanent expulsions per 1000 students. Schools which had used a zero-tolerance policy had a mean short-term suspension rate of 132.58 suspensions per 1000 students while those which had not used a zero-tolerance policy had a rate of 49.29 per 1000. This difference of 83.28 days per 1000 students (p = 0.002, 95% CI = [16.48, 141.75]) corresponds to a large effect size (Cohen's d =1.11). Three-hundred sixty-five day expulsion per 1000 students was also higher in schools which had used a zero-tolerance policy— 1.70 versus .00 permanent expulsions per 1000 student. This difference of 1.70 365-day expulsions (p = not reported, 95% CI = [0.92, 2.22]) corresponds to a large effect size (Cohen's d = 22.13). Permanent expulsion per 1000 students was also higher in schools which had used a zero-tolerance policy— 1.32 versus .01 permanent expulsions per 1000 student. This difference of 1.31 permanent expulsions (p = not reported, 95% CI = [0.42, 2.11]) corresponds to a large effect size (Cohen's d = 10.71). They also had significantly lower rates of cases that appeared at intake per 1000 students. Schools which used a zero-tolerance policy had .00 cases which appeared at intake, while those which did not use a zero-tolerance policy reported a mean of .06 per 1000 students for a difference of -.06 cases per

1000 students (p= not reported, 95% CI for mean difference= [0.03, 0.09]). The effect size of this difference was small (Cohen's d = 0.16).

Middle Schools: Twenty-seven of 195 middle schools with a zero-tolerance policy expelled at least one student based on the policy. Schools which had utilized a zero-tolerance policy had a significantly higher mean short-term suspension rate per 1000 students (332.65) compared to schools which had not (193.97), a difference of 138.68 (p = 0.045, 95% CI = [28.49, 255.02]) with a medium effect size (Cohen's d =0.72). They also had a significantly higher rate of 365-day expulsion per 1000 students (1.39) compared to schools which had not (0.17), a difference of 1.22 365-day expulsions per 1000 students (p = 0.01, 95% CI = [0.65, 2.00]). Cohen's d indicated a large effect size for this difference (d = 1.42). All other uses of exclusionary discipline as well as reports to the intake officer showed no significant difference between groups.

High Schools: For high schools, 57 of 170 schools that had a zero-tolerance policy used it to expel at least one student. Schools which had used a zero-tolerance policy were more likely to enact a 365-day expulsion than other schools. The mean for schools which used a zero-tolerance policy was 2.45 365-day expulsions per 1000 students compared to 0.47 per 1000 students for schools which had not used their policy. This difference of 1.97 expulsions was large (Cohen's d = 1.09). Neither appearance at intake nor any other use of exclusionary discipline was significantly different between the two groups of schools.

Combined Schools: Only one of 22 combined schools with a zero-tolerance policy utilized it during the 2013-14 school year. There were no significant differences between this school and the 21 schools which did not use their policies.

For all schools the frequency of using 365-day expulsion per 1000 students is positively correlated with the frequency of using a zero-tolerance policy. This is not surprising, as each use of a zero-tolerance policy results in a year-long expulsion. There is a significant relationship with permanent expulsion as well for both elementary schools. The positive correlations between both short-term suspension use and appearances at intake and zero-tolerance use are artifacts that appear are due to the large number of elementary schools that have no use of zero tolerance. They are not meaningful differences.

Table 9. *Difference in exclusionary discipline and appearances at intake by zero-tolerance use and school level*

School Level	Utilized Zero-tolerance Policy	Mean short term suspensions per 1000 students [95% CI]	Mean long-term suspensions per 1000 students [95% CI]	Mean 365-day expulsions per 1000 students [95% CI]	Mean permanent expulsions per 1000 students [95% CI]	Mean appearance at intake per 1000 students [95% CI]
All School Levels (N = 1045)	No (N =954)	90.42 [83.02, 98.59]	1.69 [1.40, 2.03]	.09 [.06, .13]	.03 [.01, .04]	1.12 [.96, 1.30]
	Yes (N = 91)	238.80 [199.45, 286.33]	6.21 [4.79, 7.80]	2.06 [1.57, 2.57]	.50 [.25, .78]	4.90 [3.87, 6.02]
	Difference (Effect size)	***148.38***	***4.52***	***1.96***	***0.47****	***3.78***
Elementary	No (N = 652)	49.29 [43.14, 55.05]	.29 [.21, .38]	.00 [.00, .00]	.01 [.00, .01]	.06 [.03, .09]

(N = 658)	Yes (N = 6)	132.58 [65.12, 189.83]	1.71 [.00, 4.07]	1.70 [.91, 2.23]	1.32 [.42, 2.12]	.00 [.00, .00]
	Difference (Effect size)	***83.28**** ***1.11***	1.42	***1.70**** ***22.13***	***1.31**** ***10.71***	***-0.06**** ***0.16***
Middle (N = 195)	No (N = 168)	193.97 [168.41, 223.15]	4.50 [3.41, 5.73]	.17 [.08, .27]	.07 [.02, .14]	2.77 [2.31, 3.31]
	Yes (N = 27)	332.65 [223.53, 448.10]	5.55 [3.81, 7.41]	1.39 [.83, 2.13]	.26 [.00, .73]	3.92 [2.26, 6.02]
	Difference (Effect size)	***138.68**** ***0.72***	1.05	***1.22**** ***1.42***	.19	1.15
High (N = 170)	No (N = 113)	176.09 [152.12, 199.06]	5.72 [4.39, 7.06]	.47 [.28, .71]	.06 [.02, .12]	4.80 [4.07, 5.56]

	Yes (N = 57)	208.38 [168.80, 249.09]	7.11 [4.83, 9.52]	2.45 [1.76, 3.16]	.53 [.20, .94]	5.97 [4.75, 7.20]
	Difference (Effect size)	32.29	1.39	***1.97**** ***1.09***	.47	1.17
Combined (N = 22)	No (N = 21)	77.95 [50.65, 109.80]	1.06 [.36, 1.82]	.33 [.00, .82]	.14 [.00, .47]	1.04 [.41, 1.76]
	Yes (N = 1)	76.41 [76.41, 76.41]	.00 [.00, .00]	.00 [.00, .00]	.00 [.00, .00]	.00 [.00, .00]
	Difference (Effect size)	-1.54	-1.06	-.33	-.14	-1.04

Question 2D: Will schools with higher rates of zero tolerance-policy use have greater rates of exclusionary discipline use and appearances at intake?

Hypothesis 2D: We anticipate positive correlations between the rate of use of zero-tolerance policies and rates of exclusionary discipline and appearance at intake.

Methods for Question 2D

Correlations with bootstrapping were used to test the strength of the relationships between each measure of school safety and the measures of exclusionary discipline and appearances at intake. The number of samples for the bootstrap was 1000 and simple sampling was used.

Results for Question 2D

Note: Results for question 2D are for all schools during 2013-14.

Table 10 lists the correlation coefficients for the frequency of use of zero-tolerance and all types of exclusionary discipline and appearances at intake. For elementary, middle, and high schools year-long expulsion is positively correlated with the frequency of using a zero-tolerance policy. There is a significant relationship with permanent expulsion as well for both elementary and high schools. This is not surprising as the purpose of zero-tolerance policies is to require a recommendation of expulsion for a specified list of offenses.

Table 10. *Correlation between use of zero-tolerance and discipline outcomes by school level 2013-14*

Number of uses of zero-tolerance policy per 1000 students	Correlations				
	Exclusionary Discipline				Appearance at Intake per 1000
	Short-term suspension per 1000	Long-term suspension per 1000	365-day expulsion per 1000	Permanent expulsion per 1000	
Elementary (N = 658)	.099*	.123**	.889***	.714***	-.015
Middle (N = 195)	.209**	-.007	.534***	.102	-.015
High (N = 170)	.076	.020	.657***	.352***	.199**
Combined (N = 22)	-.005	-.131	-.068	-.048	-.148

* p < .05 ** p < .01 ***p < .001

Note: We may use the Cohen's rule of thumb for interpreting the correlation coefficient (p.83, 1988), i.e., r =0.10 small, r=0.30 medium, and r=0.50 large. This Cohen's convention looks small, but these correspond to the well-known Cohen's d (d=0.2 small, 0.5, medium, and 0.8 large)

Research Question 3: What is the relationship between the school climate and the use of exclusionary discipline and student appearances at intake?

Variables and Descriptive Statistics for Research Question 3

Data on school climate come from the Virginia Secondary School Climate Survey (see Cornell, 2016 for information on the School Climate surveys). At this point in the project, we have only analyzed data for the 2013-14 school year. In this year, the Climate Survey was administered to high school students. Therefore, the analysis for Research Question 3 is limited to high schools. We created three main measures of school climate each of which was split into two subscales. The first measure is the extent to which students are engaged in school (student engagement) which consists of both affective and cognitive engagement. The second measure addresses how well students feel supported at school (student support) in terms of how they feel treated by adults at school (respect for students) and how willing they are to ask those adults for help (willingness to seek help). The third measure addresses the disciplinary structure of the school (school disciplinary structure). This is represented by the academic expectations that students believe their teachers have for them (academic expectations) and how fairly students believe that rules are applied (disciplinary structure). An overall measure of school climate was created by adding the three scores together. Appendix D lists items used in each measure along with measures of reliability for each scale.

Question 3A: What is the relationship between the school climate and the use of exclusionary discipline?

Hypothesis 3A: We anticipate that there will be strong negative correlations between positive school climate and the use of exclusionary discipline.

Question 3B: What is the relationship between the school climate and appearances at intake?

Hypothesis 3B: We anticipate that there will be a strong negative relationship between positive school climate and appearances at intake.

Methods for Questions 3A and 3B

Correlations with bootstrapping were used to test the strength of the relationships between each measure of school climate and the measures of exclusionary discipline and appearances at intake. The number of samples for the bootstrap was 1000 and simple sampling was used.

Results for Questions 3A and 3B

Table 11 shows the correlations between school climate and exclusionary discipline and appearances at intake. We found small to medium correlations between school climate and all four measures of exclusionary discipline and appearances at intake. Schools with less positive climates had higher uses of short-term and long-term suspension, of both year-long and permanent expulsion, and of appearances at intake. Because all three subscores of the school climate survey show similar correlations, we will report specifics for the overall climate score and each measure of exclusionary discipline and appearances at intake.

Schools which have better climate scores tend to have lower rates of uses of all types of exclusionary discipline and fewer appearances at intake. The correlation with short-term suspensions is stronger than the correlations with the other factors.

Table 11. *Correlations between school climate and exclusionary discipline and appearances (high school 2013-14)*

Measures of School Climate/Student (N=320)	Correlations				
	Exclusionary Discipline				Appearance at Intake per 1000
	Short-term suspension per 1000	Long-term suspension per 1000	365-day expulsion per 1000	Permanent expulsion per 1000	
Overall School Climate[a]	-.335**	-.174**	-.201**	-.170**	-.186**
School Disciplinary Structure[b]	-.298**	-.157**	-.170**	-.135*	-.180**
Student Engagement[c]	-.299**	-.132*	-.176**	-.175**	-.129*

Student Support[d]	-.374**	-.225**	-.237**	-.171**	-.247**

* p < .05 ** p < .01

: We may use the Cohen's rule of thumb for interpreting the correlation coefficient (p.83, 1988), i.e., r =0.10 small, r=0.30 medium, and r=0.50 large. This Cohen's convention looks small, but these correspond to the well-known Cohen's d (d=0.2 small, 0.5, medium, and 0.8 large)

[a] Higher scores indicate better school climate.

[b] Higher scores indicate more highly structured school.

[c] Higher scores indicate greater student engagement.

[d] Higher scores indicate greater student support.

Research Question 4: What are the influences of cultural factors on the STPP in Virginia?

To answer this research question we analyzed the effects of race, IEP status, and gender on appearance at intake and exclusionary discipline.

Question 4a: Are certain groups of students (defined by gender, IEP status, and race/ethnicity) overrepresented in terms of offenses and appearances at intake compared to their representation in the Virginia school student population?

Hypothesis 4A: We anticipate that both offenses and appearances at intake will be higher among minority students and those with an IEP.

We considered four questions:

a) What percentages of various groups (defined by gender, race/ethnicity, IEP status, school level, and the intersection of all four) of Virginia students appear in the DCV data set?

b) What percentages of the same groups of Virginia students appear at intake?

c) What percentages of the same groups of students who are in the DCV data set appear at intake?

d) On average, how many days of suspension are assigned for different groups of individuals?

We answered this question for the 2013-14 school year. In order to provide a more fine-grained analysis of the differences between groups, we separated the analysis by school level and considered individual attributes both separately and in terms of their intersection. For instance, how do the odds of appearing at intake differ for a white male without an IEP and a white male student with an IEP? In order to control for the size of each group, we calculated each statistic as a percent of the total number of students in that group.

We found the percent of all Virginia public school students who committed at least one offense (i.e. appeared in the DCV data set at least once) and who appeared at intake as well as the percent of students in the DCV data set who appeared at intake. Between the time a student takes some action in school and the time at which they appear before an intake officer as a result of that action, many decisions are made. Ultimately, these decisions determine whether a student's action results in a trip to the intake officer. In order for a student's action to result in an appearance at intake, an administrator must first name the action as a disciplinary offense that is required to be entered into the DCV data set. While some actions unquestionably belong in this

group, it is likely that there are actions for which the choice to name them as such is discretionary. Although we have no data on this, it is important to consider when interpreting the data. Second, the offense must be reported to the intake officer. Even for offenses which are required to be "reported to law enforcement", we found that this requirement was interpreted differently in different cases. Sometimes a report meant that the administrator had simply discussed the case with the SRO and let the SRO talk with the student and in other cases it meant that the case had gone to the intake officer. Depending on the administrator's interpretation of "required to be reported," these cases may or may not be considered discretionary. There are also offenses that were not required to be reported to law which ended up at intake. These are certainly discretionary. By comparing the percentages we calculated, we create a more focused picture of what is happening in our schools. We examined these percentages by race, IEP status, and gender to see if and how they differ.

Variables and Descriptive Statistics

Data for this question come from multiple sources. Information on students who committed offenses, including type of offense, demographic information for the student, and how many days the student was suspended, come from the DCV data set. Information on students who went to the intake officer come from the DJJ data set. These cases were matched with corresponding cases in the DCV data as described in the initial section of this report. Information about the public school population in Virginia comes from the VDOE and OCR data sets.

We found that 60% of the students in the DCV data set committed multiple offenses. We also found that the entries for student gender, race/ethnicity, and IEP status contained errors. For instance, a student who appeared in the DCV data set five times may be recorded as "male" in

four of the entries and "female" in the remaining entry, "white" in three entries and no race entered in the remaining two entries, and "with an IEP " in two entries and "without IEP" in three. In addition, the student may have appeared at intake for one of these offenses but not the others. In order to find what percentage of students of a particular race/ethnicity of Virginia students appeared at intake, we had to count only one offense per student. Therefore, we had to create a protocol for making sense of the contradictory entries. We describe our method in the next section.

Methods for Question 4A

Before we could calculate statistics based on individual attributes such as gender, race/ethnicity, and IEP status, we had to assign one value for each attribute to each individual. In order to do this, we first created a new data set from our individual file. This new data set included all cases in the individual file, but only the following variables for each case: ID number, gender, race/ethnicity, IEP status, and appearance at intake. We then divided the cases into two sets: 1) cases for which individual attributes were entered consistently and 2) cases that contained at least one contradiction. For the first set, each individual was counted one time. Individuals were coded as appearing at intake if one or more of their offenses resulted in an appearance. For the second set, one entry which assigned the dominant value for each individual attribute was created for each individual. Again, individuals were counted as appearing at intake if one or more of their offenses resulted in an appearance. There were individuals in the second set for whom one or more of the individual attributes were either indeterminate (no value was dominant) or missing. For these cases we used multiple imputation to assign attribute values. Multiple imputation is a statistical technique in which missing values are assigned in accordance with the distribution of known values in the population. As a result of multiple imputation, we

had five datasets of students with the indeterminate attributes. We combined each of them with the complete datasets (i.e., consistent dataset and dataset corrected by dominant values) and counted the students of interest, resulting in 5 frequency tables. To determine the final counts to be reported, we calculated the average over 5 tables. We rounded the averages to the nearest whole number. A detailed explanation of this process is given in Appendix E. Examples of each situation are shown in Figure 1.

Individual A					Individual B				
1	M	W	N	N	8	M	---		N
1	F	W	N	Y	8	M	---	---	N
1	M	---	Y	N	8	M	A	Y	N
1	M	W	N	N				N	
1	M	---	Y	N					
Decision: *We counted this individual as male, white, without an IEP, and did appear at intake.*					Decision: *We determined that this individual is male and did not appear at intake. We assigned values for race and IEP status using multiple imputation.*				

Figure 1. Assigning individual attributes to individuals

Results for Question 4A

We have organized this section to better illustrate which groups of students are over- and underrepresented in terms of committing offenses and appearing at intake. For each group classification, we first present its ratio of the Virginia public school population and, second, the ratio of the group that committed an offense or appeared at intake. This order of presentation allows the two ratios to be easily compared. We present the ratio of students who committed offenses in the greatest detail. First we present ratios by school level. Second, we present ratios for gender, race/ethnicity, and IEP status by school level. Finally, we present ratios by the intersection of all four factors. For the ratios of students who appear at intake, we only present two sets of ratios: students who appear at intake as a ratio of all Virginia public school students, and students who appear at intake as a ratio of students who committed an offense. Both sets are presented by the intersection of gender, race/ethnicity, and IEP status.

O*ffenses by School Level*

Figure 2 shows the number and percent of students in Virginia who did and did not commit an offense by school level. In our dataset, there are 585,818 students in elementary schools, 249,334 in middle schools, 354,593 in high schools, and 35,543 in combined schools. Among them, 17,548 elementary school students (3.0%), 28,072 middle school students (11.3%), 34,164 high school students (9.6%), and 1,996 students in combined schools (5.6%) committed at least one offense. Furthermore, 29 elementary school students, 1,929 middle school students, 907 high school students, and 84 combined school students went to intake officer. All of these are less than 1% of the total enrollment at each school level.

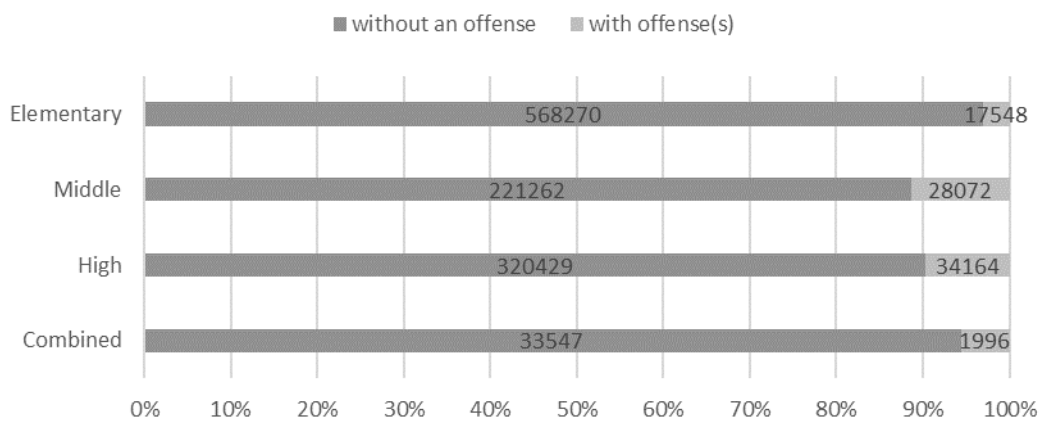

Fig. 2 Number/percentage of students with/without offense(s) by school level

Offenses by Gender and School Level

Fig. 3 shows the percentages of male and female students in the population. There are slightly more males than females across the school levels (i.e., around 53% for male and 47% for female).

Fig. 4 presents the number of students per 1000 males/females in the population who committed at least one offense in 2013-14 by school level. As shown in the figure, male students are more likely to have offenses than female students. The odds ratios are 3.68 for elementary schools, 2.54 for middle schools, 2.15 for high schools, and 2.71 for combined schools.

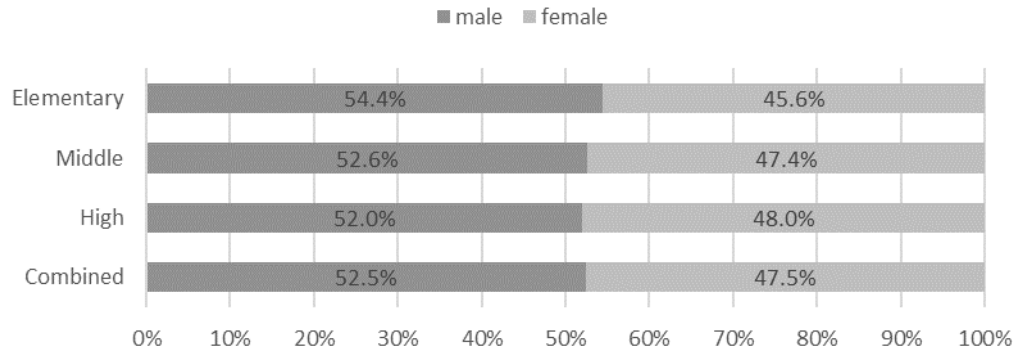

Fig. 3 Percentage of Virginia students' gender by school level

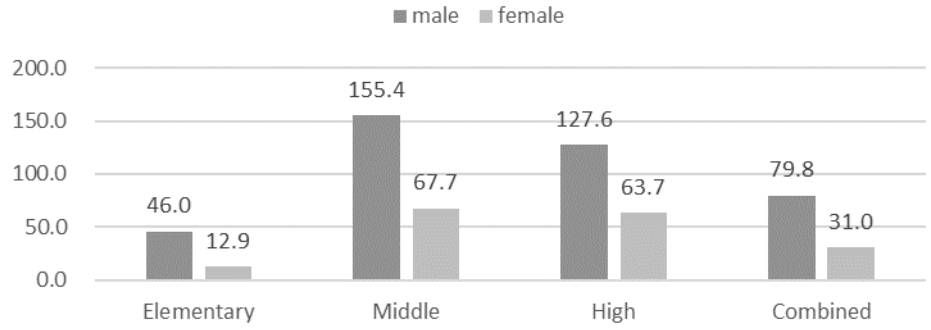

Fig. 4 Number of students with offense(s) per 1000 males/females by school level

Offenses by Race/Ethnicity and School Level

As shown in Fig. 5, the percentages of race/ethnicity in Virginia schools vary slightly by school level. Between 50 and 60% of the students are white, 18 to 23% are black, 11 to 15% are Hispanic, 6 to 8% are Asian, and 4 to 6% are other races/ethnicities. The distribution is very similar across the school levels, though there are more white students and fewer black students in combined schools compared with the other school levels. Also, there is a tendency that lower level schools have a higher percentage of Hispanic students.

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According to Fig. 6, which illustrates the number of students per 1000 for each race/ethnicity who committed offense(s), the likelihood of black students having an offense is at least 2.68 times as white students.

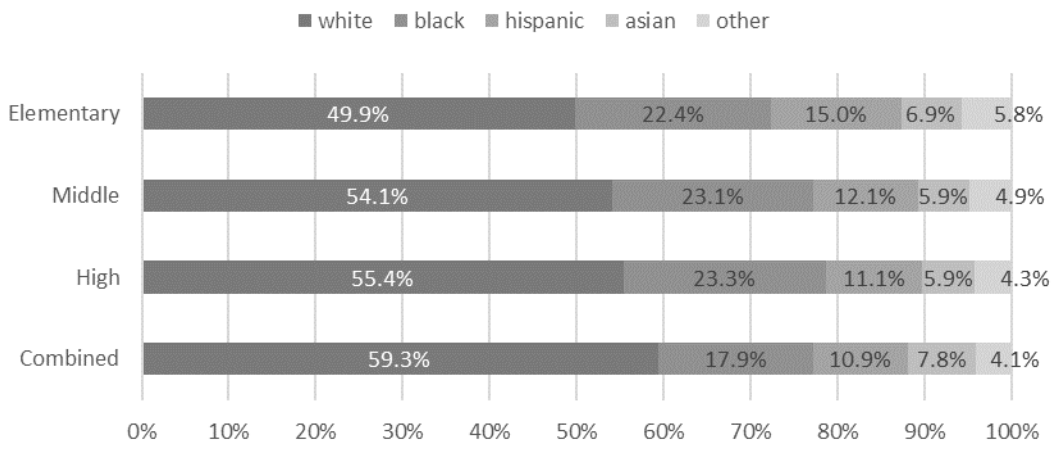

Fig. 5 Proportion of Virginia students' race/ethnicity by school level

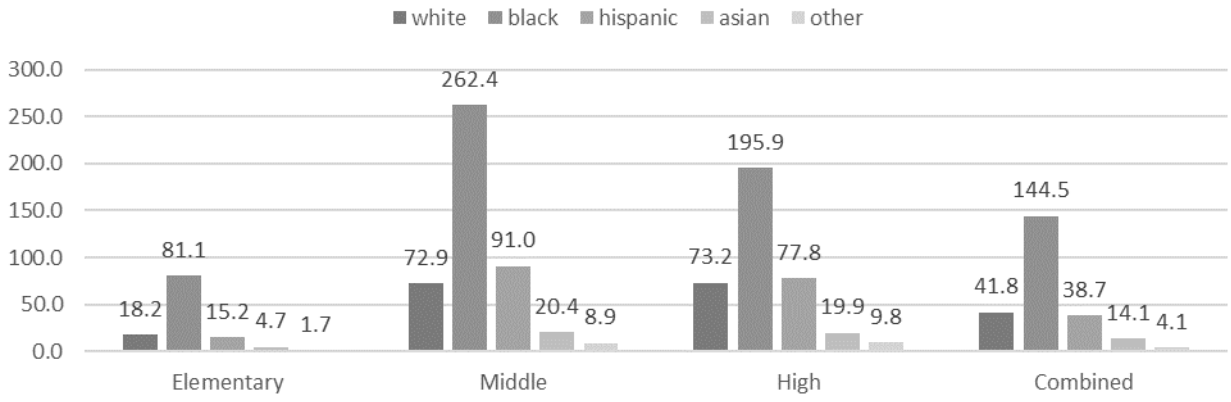

Fig. 6 Number of students with offense(s) per 1000 White / Black / Hispanic / Asian / Other race students by school level

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Offenses by IEP Status and School Level

Fig. 7 illustrates the percentage of students with an IEP under the Individuals with Disability Education Act (IDEA). It indicates that 12% to 15% of the students have an IEP across the school levels. Fig. 8 shows the number of students per 1000 students with an IEP and male students without an IEP who committed an offense. Compared to students without an IEP, those with an IEP are approximately three times more likely to have an offense.

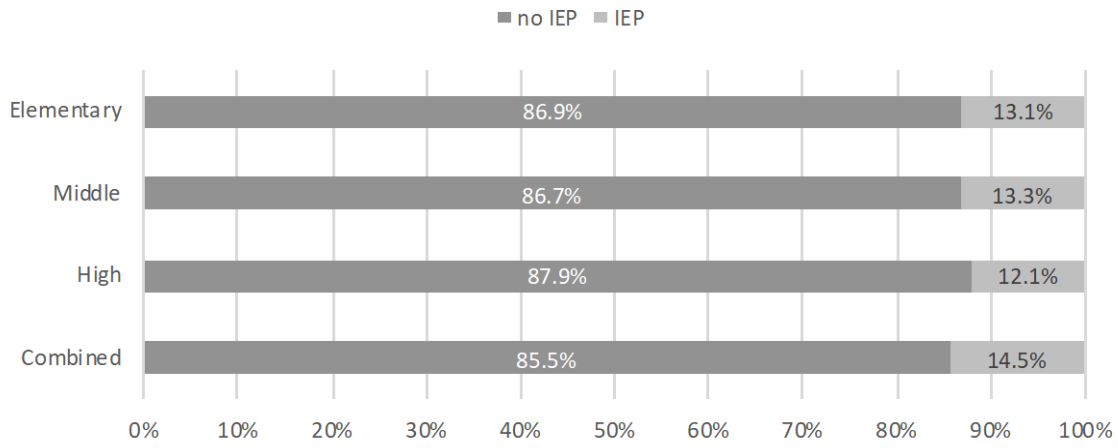

Fig. 7 Special Education status of Virginia students

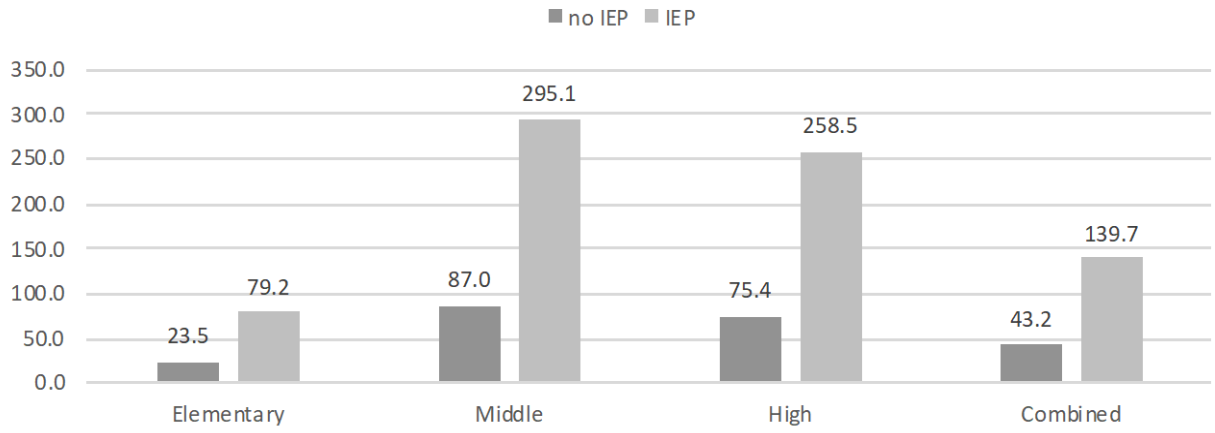

Fig. 8 Number of students with offense(s) per 1000 students with/without an IEP by school level

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Offense by Intersection of Race/Ethnicity, Gender, IEP, and School Level

Fig. 9 presents the percentage of Virginia students by the intersection of individual attributes (i.e., gender by IEP status) within each school level. It shows that the distribution of the attributes is similar across the school levels; the percentages of Asian and other race/ethnicity, students with an IEP are less than half of white, black, and Hispanic students. At the same time, the percentage of male students with an IEP is approximately twice as high as female students across race/ethnicity. As a result, the order of the students' categories within a race/ethnicity is common; the female students without an IEP, the male students without an IEP , the males students with an IEP, and the females students with an IEP in descending order.

Fig. 10 is the number of students with offenses per 1000 students in the group (defined by the intersection of gender, race/ethnicity, and IEP status) by school level. The patterns of the student counts within each school level are similar; the male students with an IEP are most likely to have offenses, followed by the female students with an IEP, the male students without an IEP , and the female students without an IEP . Also, black students are more likely to have offenses than white students, Asian students and students of other races/ethnicities. As a result, black, male, students with an IEP are most likely to have offense(s) of all student groups in the figure. Odds ratios of the students in this group (i.e., black, male, with an IEP) compared to the second-highest category are 2.02 for elementary schools (with black, male, without an IEP), 2.18 for middle schools (with black, female, with an IEP), 1.64 for high schools (with black, female, with an IEP), and 1.58 for combined (with black, female, with an IEP), respectively.

Appearance at Intake by Intersection of Gender, Race/Ethnicity, and IEP Status by School Level Compared to All Virginia Public School Students

Fig. 11 shows the number of students who appeared at intake per 1000 students in that group in Virginia public schools. As shown in the figure, black male students with an IEPare most likely to appear at intake across all school levels. The odds ratios of these students and the second-highest category are 1.53 for elementary (with black female with an IEP), 2.14 for middle (with black male without an IEP), 1.94 for high (with black male without an IEP), and 2.15 for combined (with black female without an IEP). Also, male students with an IEP achieve the highest counts in almost all school levels and race/ethnicities. Note that few elementary school students and few students who are neither white nor black appeared at intake, which may cause unstable estimates. This is further mentioned below.

Compared to Students Who Committed at Least One Offense

Fig. 12 describes the number of students who appeared at intake per 1000 students who committed at least one offense. For middle school students and high school students, there is no large difference between race/ethnicity that was found in figure 11, especially between black and white students. For elementary and combined schools, this is not true because of the uncertainty of the results stemming from few occurrences of students going to intake officer.

In contrast to the results shown in figure 11, where the number of students going to intake officer is compared to the total enrollment, the students with an IEP are less likely to go to intake officer than students without an IEP when compared to the number of students who committed offenses. Fig. 11 Number of students per 1000 of each category who appear at intake in the population. Fig.12 Number of students per 1000 of each category who committed offense(s) and appear at intake.

Summary

The main results of Question 4A can be summarized in the following three points.

(1) Across school levels, black, male, students with an IEP are the most likely to have at least one offense. The odds ratio with the second-highest student category is at least 1.5.

(2) Across school levels, black, male, students with an IEP are the most likely to go to intake officer. The odds ratio with the second-highest category is at least 1.5.

(3) Once a student committed an offense, black male students with an IEP are no longer the most likely to appear at intake; they are less or as likely to do so as other students.

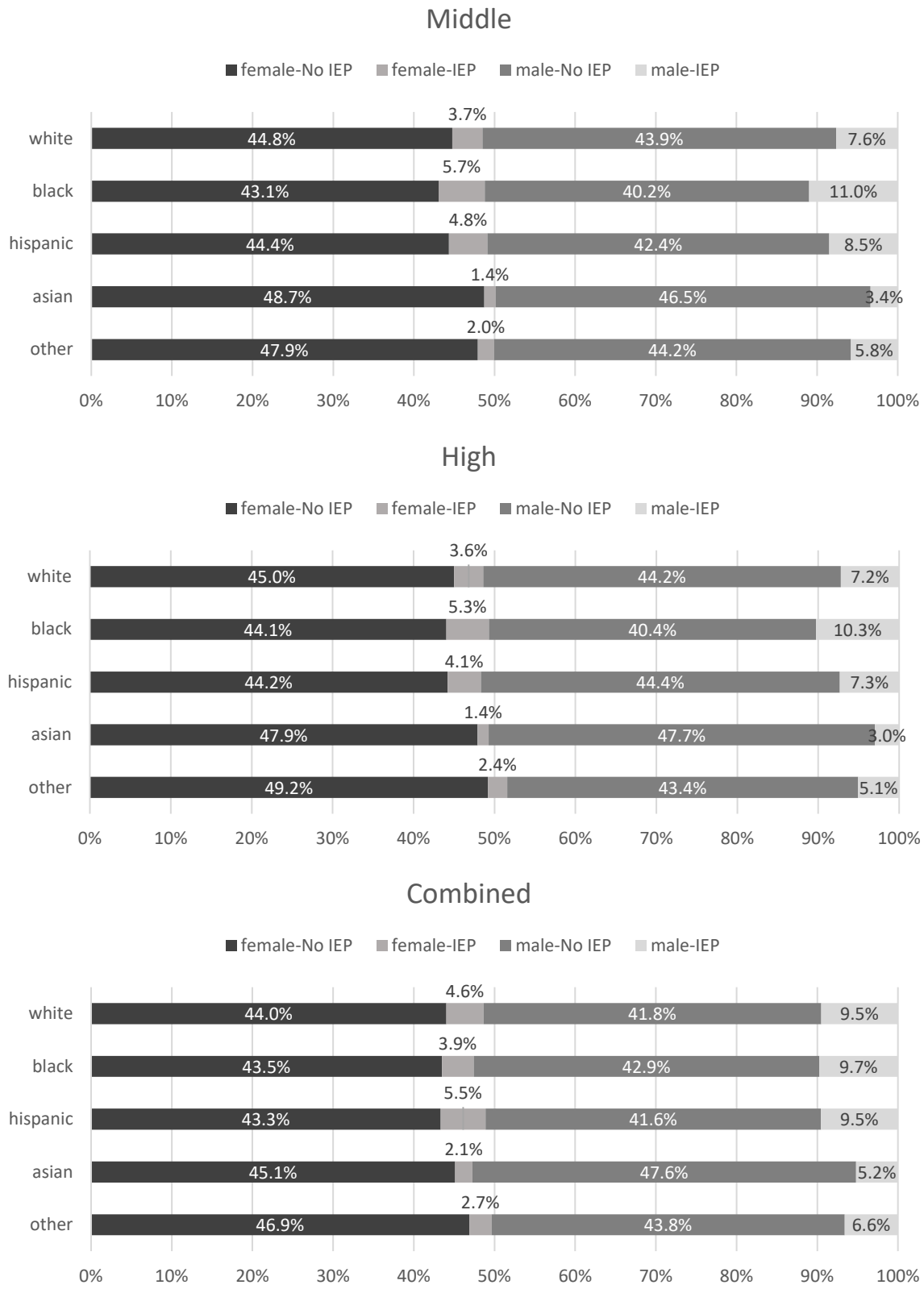


Fig. 9 Gender and IEP status of Virginia students by school level and race/ethnicity

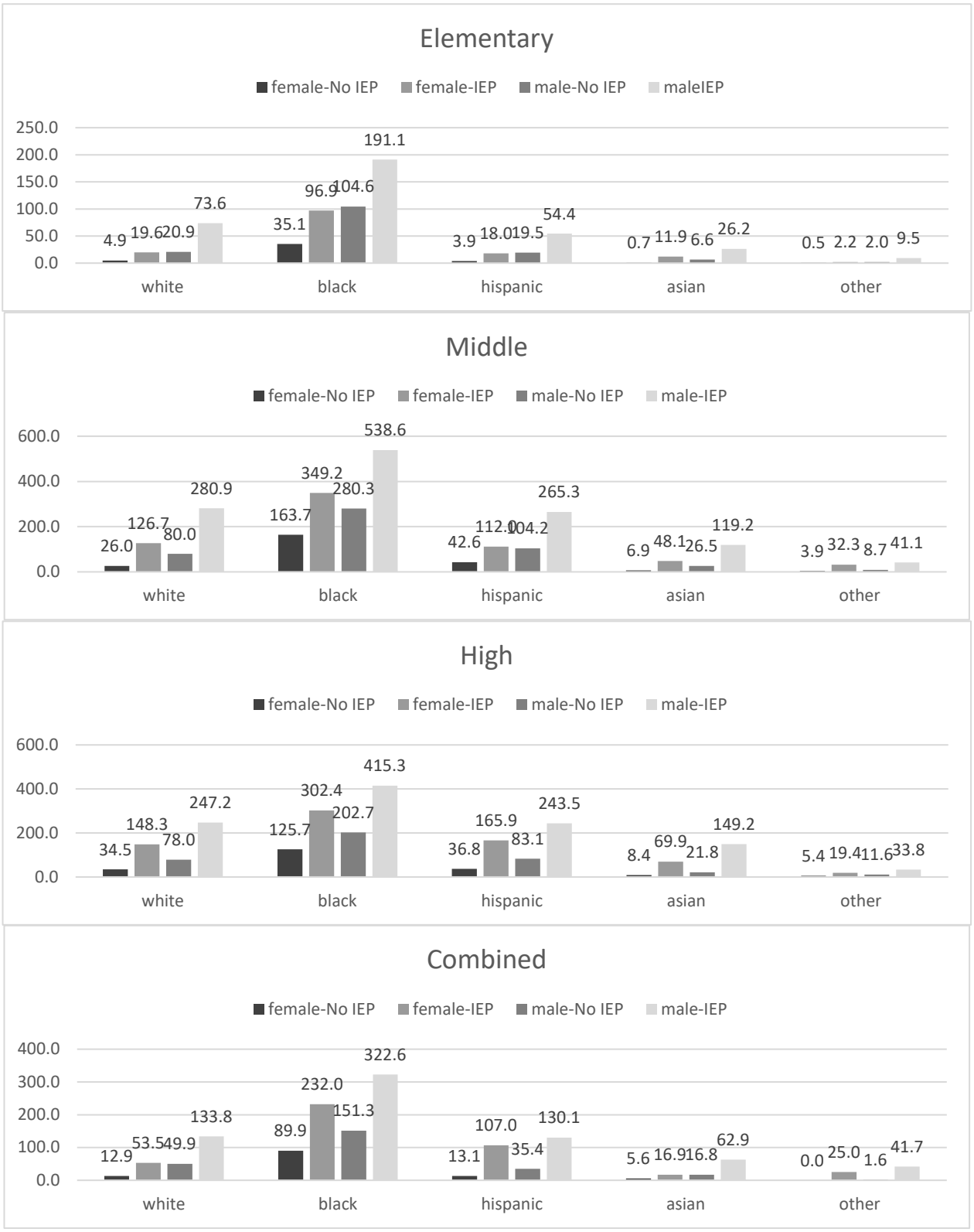


Fig. 10 Number of students with offenses per 1000 of group by school level, gender, race/ethnicity, and IEP

Question 4B: What is the relationship between cultural factors and days of exclusionary discipline assigned for offenses that appear in the DCV data set?

Hypothesis 4B: We anticipate that the mean days of suspension assigned to students will be higher among minority students and those with an IEP.

Variables and Descriptive Statistics for Question 4B

We answered this question for both years (2013-14 and 2014-15) using data from the Discipline, Crime and Violence (DCV) data set. To do this we performed multiple regressions to find the effect of race, IEP status, and gender on the number of days of exclusionary discipline assigned for an offense. We controlled for whether the offense was classified as violent or nonviolent and whether it was required to be reported to law enforcement. Controlling for whether the offense was required to be reported allows us to see if cases are reported at different rates when administrators are allowed to use their judgement. Numbers of cases that were not required to be reported and that were referred to law enforcement for different races and IEP statuses are listed in Tables 12 and 13 for the two years of data. For 2013-14, there were 6,472 cases which had no entry for race and, for 2014-15, there were 6,707 cases. These are reported as "Missing". As can be seen in Table 12 and 13, cases which were not required to be reported were much less likely to be reported to law enforcement.

Table 12. *Offense cases in DCV data set 2013-14*

Demographic	Total	Not Req	Req	AI	Req/AI	Not-Req/AI	Req/Not-AI
Race							
Asian	1350	1148	202	20	19	1	183
Black	88146	82670	5476	1490	1000	490	4476
Hispanic	11998	10808	1190	196	171	25	1019
Missing	6472	5930	542	26	20	6	522
Other	566	517	49	2	2	0	47
White	53089	48410	4679	1283	947	336	3732
Total	161621	14983	12138	3017	2159	858	9979
IEP							
Without an IEP	97136	89097	8039	2194	1594	600	6645
With an IEP	64485	60386	4099	823	565	258	3534
Total	161621	149483	12138	3017	2159	858	9979

Gender							
Male	120141	110910	9321	2209	1606	603	7625
Female	41480	38573	2907	808	553	255	2354
Total	161621	149483	12138	3017	2159	858	9979

Note. Not Req = not required to report to law enforcement, Req = required to report to law enforcement, AI = appeared at intake, Req/AI = required to report to law enforcement and appeared at intake, Not-Req/AI = not required to report to law enforcement and intake, Req/Not-AI = required to report to enforcement and did not appear at intake

Table 13. *Offense cases in DCV data set 2014-15*

Demographic	Total	Not Req	Req	AI	Req/AI	Not-Req/AI	Req/Not-AI
Race							
Asian	1220	1050	170	23	23	0	147
Black	86448	81262	5186	1283	848	435	4338
Hispanic	13156	11877	1279	215	184	31	1095
Missing	6886	6345	541	35	24	11	517
Other	675	609	66	3	3	0	63
White	50397	45940	4457	1129	906	223	3551
Total	158782	147083	11699	2688	1988	700	9711
IEP							
Without an IEP	97163	89425	7738	1942	1422	520	6316
With an IEP	61619	57658	3961	746	566	180	3395
Total	158782	147083	11699	2688	1988	700	9711
Gender							

Male	117704	108953	8751	1949	1476	473	7275
Female	41078	38130	2948	739	512	227	2436
Total	158782	147083	11699	2688	1988	700	9711

Note. Not Req = not required to report to law enforcement, Req = required to report to law enforcement, AI = appeared at intake, Req/AI = required to report to law enforcement and appeared at intake, Not-Req/AI = not required to report to law enforcement and intake, Req/Not-AI = required to report to enforcement and did not appear at intake

We chose days, rather than counts, of suspension as our measure of exclusionary discipline because the longer a student is absent from school, the larger the potential impact of the absence. Using days as our measure accounts for the probable larger impact of longer suspensions. Days of suspension come from the DCV data set and range from zero to 365 as shown in Table 14. In both years, cases for which suspension days were 10 or fewer (short-term suspensions) account for over 97% of the entries in the data set. However, even though there are few cases of long-term suspensions and expulsions, those cases for which suspension days are large have an outsized effect on the analysis.

Table 14. *Days of Suspension from DCV data set*

Year	2013-14		2014-15	
Days of Suspension	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
0	9,524	5.9%	9,250	5.8%
1-10	147,934	91.5%	145,693	91.8%
11-180	3,541	2.2%	3,184	2.0%
181-363	11	0.0%	5	0.0%
364	246	0.2%	241	0.2%
365	365	0.2%	409	0.3%
Total	161,621	100.0%	158,782	100.0%

After examining the data, we concluded that the record of days of suspension is inconsistent between cases of short-term and some cases of long-term suspension. It appears that only school days are counted in short-term suspensions, while calendar days are counted for some long-term suspensions. The Virginia Department of Education (VDOE) defines short-term suspensions as having a duration of 10 or fewer *school* days and expulsions as a suspension of 365 *calendar* days. (Reference??????) We believe that the relatively large numbers of cases for which 364 days—one day less than a calendar year-- were assigned represent incidents for which

students were suspended for the largest number of calendar days possible without recommending the student for expulsion, and that cases for which 365 days were assigned are expulsions.

We recoded the days of suspension to more accurately reflect the number of school days missed. We know that there are 180 school days in a school year for most districts in Virginia. Therefore, a student who is expelled for 365 calendar days misses approximately 180 days of school and a student who is suspended for 364 calendar days misses about 179 days of school. In order to more accurately measure the effect of longer-term suspensions, we used the following rule to convert what appear to be numbers of calendar days to numbers of school days:

- For days of suspension between zero and 180, school days suspended equals the days of suspension.
- For days of suspension between 181 and 364, school days suspended equals 179.
- For days of suspension equal to 365, school days suspended equals 180.

In order to clarify which measure we are referring to, we will call this new measure "School Days Suspended". We used this new measure of school days suspended (ranging from 0 days to 180 days) in our analysis. Although we can't be certain that the new measure is completely accurate, we believe that it is probably closer to the actual number of school days missed by students due to the offenses in the data set.

We analyzed data by school level: elementary, middle, high, and combined. School levels come directly from the School Safety Survey, or in the few cases for which this value was missing, from the school's website. Preschools and primary schools were included in the Elementary category. Combined schools are those schools that include a range of grades (e.g. grades 1-8 or grades 7-12) that crosses traditional school level boundaries.

Table 15. *Offense Cases by School Level and Year from DCV*

Year	2013-14		2014-15	
School Level	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
Elementary	32,034	19.8%	32,028	20.2%
Middle	60,161	37.2%	57,119	36.0%
High	65,564	40.6%	65,364	41.2%
Combined	3,862	2.4%	4,271	2.7%
Total	161,621	100.0%	157,782	100.0%

While both the number of cases (shown in Table 15) and the mean number of school days suspended at each school level (shown in Table 16) remained relatively constant between years, these measures differed significantly *between* school levels. Table 16 shows the mean number of school days suspended at each school level by year as well as comparisons between school levels. High schools had the highest mean number of days. Each of the lower levels was compared to high schools to see if differences were significant. Because data violate both assumptions of normality and homogeneity of variance, we used bootstrapping (with 1000 bootstrapped samples) when comparing means. For 2013-14 when including all days, there was a significant difference in the mean number of days of suspension between school levels (*Welch's* F (3, 17956) = 867.6, p = .000). The same was true when including only suspension days

(*Welch's F* (3, 18109) = 919.6, p < .001), and when including only short-term suspension days (*Welch's F* (3, 17476) = 2622.1, p < .001). There was also a significant difference in the mean days of suspension between school levels for 2014-15 data for all measures of days of suspension—including all days (*Welch's F* (3, 19723) = 804.1, $p < .001$), including only suspension days (*Welch's* F (3, 19896) = 787.8, $p < .001$), and including only short-term suspensions (*Welch's F* (3, 19372) = 2905.2, $p < .001$). Games-Howell post hoc tests were used to test for individual group differences because the assumption of homogeneity of variance was not met. These showed statistically significant differences between mean days for high schools and each of the other groups. Although effect sizes for these differences were small, analyzing data by school level was important. We found that aggregating the data caused important differences at the middle and high school levels to be masked by the large number of elementary schools.

In order to better understand the demographic proportions of offense cases that occurred within each school level for each school year, we further divided the offense cases by gender, race/ethnicity, IEP status, whether the offense was violent, and whether the offense was required to be reported to law enforcement. Gender and race/ethnicity both come directly from the DCV data set. The only change is that we collapsed the race/ethnicity groups American Indian/Alaska Native and Native Hawaiian/Other Pacific Islander into Other. Cases for which no race/ethnicity was listed are combined in the "Missing" group. The DCV data set lists multiple types of disabilities. We coded both students for whom at least one IEP category was marked and those with a 504 plan as with an IEP. We considered offenses that involved violence against persons as violent. For instance, we coded weapons offenses, which generally consisted of simply bringing a knife (such as a pocket knife) to school, as nonviolent. If the weapon was used against a

person, then an assault offense should also be indicated in the data set and the incident was coded as violent. Appendix B lists both violent and nonviolent offenses. Finally, we classified each offense as either required or not required to be reported to law enforcement. These classifications come from Reference Table 1 in section VIII of the *Comprehensive User Guide for Discipline, Crime, and Violence (DCV) Data Collection and Submission 2013-14* which indicates which offenses are required to be reported to law enforcement by shading the offense codes. The percentage of each of these variables that fall into each category for each year are reported in Tables 17, 18, and 19.

Table 16. *Mean school days suspended by school level and year*

Types of Exclusionary Discipline Included	Year	School Level	School Days Suspended		
			Mean [95% CI]	Difference from High School [95% CI]	Effect Size (Cohen's D)
All suspensions and expulsions (0 ≤ Days of Suspension ≤ 180)	2013-14	Elementary	2.05 [1.99, 2.11]	-3.49 [-3.33, -3.65]	.23
		Middle	4.00 [3.90, 4.10]	-1.54 [-1.38, -1.73]	.10
		High	5.54 [5.39, 5.68]	---	---
		Combined	4.40 [3.99, 4.87]	-1.14 [-0.66, -1.58]	.06
	2014-15	Elementary	2.04 [1.98, 2.10]	-3.36 [-3.16, -3.56]	.22
		Middle	4.03 [3.93, 4.14]	-1.37 [-1.14, -1.60]	.09
		High	5.40 [5.26, 5.53]	---	---
		Combined	4.04 [3.67, 4.45]	-1.37 [-.80, -1.93]	.08
Only suspensions	2013-14	Elementary	1.99 [1.94, 2.04]	-2.84 [-2.72, -2.96]	.24
		Middle	3.77 [4.73, 4.94]	-1.07 [-.93, -1.21]	.08

(0 ≤ Days of Suspension ≤ 179)		High	4.83 [4.73, 4.94]	---	---
		Combined	3.76 [3.47, 4.08]	-1.07 [-.74, -1.37]	.08
	2014-15	Elementary	2.00 [1.94, 2.06]	-2.60 [-2.48, -2.71]	.22
		Middle	3.72 [3.65, 3.81]	-.87 [-.73, -1.00]	.07
		High	4.60 [4.49, 4.69]	---	---
		Combined	3.50 [3.24, 3.79]	-1.10 [-.77, -1.37]	.08
Only short-term suspensions (0 ≤ Days of Suspension ≤ 10)	2013-14	Elementary	1.78 [1.76, 1.79]	-1.18 [-1.15, -1.21]	.49
		Middle	2.68 [2.66, 2.69]	-.28 [-.25, -.30]	.11
		High	2.95 [2.93, 2.97]	---	---
		Combined	2.56 [2.48, 2.64]	-.39 [-.31, -.47]	.15
	2014-15	Elementary	1.74 [1.72, 1.76]	-1.16 [-1.13, -1.18]	.49
		Middle	2.71 [2.69, 2.73]	-.19 [-.16, -.22]	.08
		High	2.90 [2.87, 2.92]	---	---
		Combined	2.23 [2.17, 2.29]	-.67 [-.60, -.74]	.26

Note. Number of Offense Cases: Elementary = 32,034; Middle = 60,161; High = 65,564; Combined = 3,862

Table 17. *Descriptive statistics for all offense cases (results in 1-180 school days exclusion)*

Year		2013-14				2014-15			
School Level (Number of cases)		Elem (32,034)	Middle (60,161)	High (65,564)	Combined (3,862)	Elem (32,028)	Middle (57,119)	High (65,364)	Combined (4,271)
Percent of Cases	Required								
	Violent	5.10%	4.27%	3.81%	8.08%	5.07%	4.16%	3.77%	7.23%
	Nonviolent	1.42%	2.00%	5.08%	3.47%	1.15%	2.08%	4.93%	3.47%
	Not Required								
	Violent	33.62%	32.33%	16.61%	26.00%	30.84%	31.82%	16.17%	28.94%
	Nonviolent	59.86%	61.40%	74.50%	62.45%	62.94%	61.95%	75.13%	60.36%
	Race								

	Asian	0.80%	0.64%	1.01%	1.29%	0.77%	0.68%	0.82%	1.17%
	Black	60.26 %	57.15%	49.64 %	49.48 %	59.44%	56.82 %	50.08 %	51.91 %
	Hispanic	5.87%	7.93%	7.72%	7.25%	6.43%	9.20%	8.51%	6.60%
	Missing	5.24%	4.04%	3.37%	3.86%	5.47%	4.35%	3.82%	3.51%
	Other	0.27%	0.39%	0.36%	0.31%	0.39%	0.39%	0.46%	0.63%
	White	27.56 %	29.85%	37.90 %	37.81 %	27.5%	28.56 %	36.31 %	36.18 %
	IEP	36.00 %	41.00%	41.00 %	39.00 %	36.24%	38.82 %	40.19 %	36.81 %
	Female	18.53 %	26.42%	28.50 %	24.83 %	18.00%	26.73 %	29.18 %	22.83 %

Table 18. *Descriptive statistics for offense cases resulting in suspension (1-179 School Days)*

Year		2013-14				2014-15			
School Level (Number of cases)		Elem (32,024)	Middle (60,082)	High (65,299)	Combined (3,848)	Elem (32,020)	Middle (57,018)	High (65,063)	Combined (4,258)
Percent of Cases	Required Violent	5.10%	4.25%	3.77%	7.93%	5.07%	4.12%	3.71%	7.09%
	Nonviolent	1.40 %	1.94 %	4.83 %	3.38 %	1.15%	1.99%	4.69%	3.43%
	Not Required Violent	33.63 %	32.36 %	16.64 %	26.07 %	30.85%	31.85 %	16.24 %	28.96 %
	Nonviolent	59.87 %	61.46%	74.75 %	62.63 %	62.95%	62.03 %	75.41 %	60.52 %
	Race								

	Asian	0.80%	0.64%	1.01%	1.30%	0.77%	0.68%	0.82%	1.17%
	Black	60.26 %	57.16%	49.69 %	49.38 %	59.44%	56.81 %	50.10 %	51.81 %
	Hispanic	5.87%	7.93%	7.72%	7.25%	6.43%	9.21%	8.51%	6.62%
	Missing	5.24%	4.04%	3.38%	3.87%	5.47%	4.36%	3.82%	3.52%
	Other	0.26%	0.39%	0.36%	0.31%	0.39%	0.39%	0.46%	0.63%
	White	27.57 %	29.84%	37.84 %	37.89 %	27.5%	28.55 %	36.29 %	36.25 %
	IEP	36.00 %	41.00%	41.00 %	39.00 %	36.25%	38.83 %	40.27 %	36.92 %
	Female	18.53 %	26.44%	28.54 %	24.84 %	18.00%	26.74 %	29.23 %	22.80 %

Table 19. *Descriptive Statistics for Offense Cases Resulting in Short-Term Suspension (1-10 School Days)*

Year		2013-14				2014-15			
School Level (Number of cases)		Elem (31,864)	Middle (58,812)	High (63,054)	Combined (3,728)	Elem (31,833)	Middle (55,835)	High (63,171)	Combined (4,104)
Percent of Cases	Required Violent	5.04%	3.85%	3.25%	6.89%	4.95%	3.63%	3.10%	5.99%
	Nonviolent	1.22%	1.45%	3.56%	2.71%	0.99%	1.56%	3.76%	2.85%
	Not Required Violent	33.74%	32.61%	16.73%	26.61%	30.97%	32.11%	16.18%	29.19%
	Nonviolent	60.00%	62.08%	76.46%	63.79%	63.09%	62.70%	76.96%	61.96%

	Race/Ethnicity								
	Asian	0.80%	0.63%	0.99%	1.34%	0.78%	0.68%	0.81%	1.07%
	Black	60.26%	57.19%	49.79%	48.93%	59.40%	56.75%	50.04%	51.15%
	Hispanic	5.86%	7.89%	7.60%	7.14%	6.45%	9.20%	8.48%	6.65%
	Missing	5.24%	4.03%	3.36%	3.89%	5.47%	4.34%	3.79%	3.56%
	Other	0.26 %	0.39 %	0.36 %	0.32 %	0.39%	0.39%	0.46%	0.61%
	White	27.58%	29.87%	37.9%	38.38%	27.51%	28.64%	36.42%	36.96%
	IEP	36.00%	41.00%	42.00%	40.00%	36.31%	39.15%	40.83%	37.62%
	Female	18.57%	26.41%	28.68%	24.73%	18.00%	26.63%	29.32%	22.71%

Methods for Question 4B

We used multiple regression to test the effects of race/ethnicity, IEP status, and gender on schools days suspended. We controlled for whether offenses were violent and whether they were required to be reported to law enforcement. We entered the factors in five steps—first, violent and required; second, the interaction between violent and required; third, main effects of race/ethnicity and IEP status; fourth, interactions between race and IEP status; and fifth, main effect of gender. The change in R^2 was significant for each set of factors added to the model for the majority of the data sets except for the interactions between race and IEP status. Change in R^2 along with overall model fit are shown in Appendix F. The interactions between race and IEP status were not significant and did not contribute significantly to the overall explanatory power of the model. The, final regression model was:

$$School\_days\_suspended_i = \beta_0 + \beta_1 * Rquired\_Rported * + \beta_2 * Violent + \beta_3 * Rquired\_Violent\_Interaction + \beta_4 * dAsian + \beta_5 * dBlack + \beta_6 * dHispanic + \beta_7 * dMissng + \beta_8 * dOther + \beta_9 * Disabled + \beta_{10} Asian\_Disabled\_Interaction + \beta_{11} * Black\_Disabled\_Interaction + \beta_{12} * Hispanic\_Disabled\_Interaction + \beta_{13} Missng\_Disabled\_Interaction + \beta_{14} * Other\_Disabled\_Interaction + \beta_{15} * dFemale + \varepsilon_i$$

where *School_days_suspended* is the number of school days for which a student was suspended for offense *i*; β_0 is the mean number of school days suspended for white, male, students without an IEP who commit nonviolent offenses which are not required to be reported to law; β_1 is the mean difference in number of school days suspended between nonviolent offenses committed by white, male, students without an IEP that are required to be reported and those that are not required; β_2 is the mean difference in number of school days white, male, students without an IEP are suspended between non-required, violent and non-required, nonviolent offenses; β_3 is the mean difference in days for offenses that are both violent and required; β_4 is the mean difference

in days for Asian male students without an IEP compared to White male students without an IEP; β_5 is the mean difference in days for Black male students without an IEP compared to White male students without an IEP; β_6 is the mean difference in days between Hispanic male students without an IEP and White male students without an IEP; β_7 is the mean difference between male students without an IEP who had no entry for race and White male students without an IEP; β_8 is the mean difference in days between male students without an IEP classified as Other race and White male students without an IEP; β_9 is the mean difference between White male students with an IEP and White male students without an IEP; β_{10} is the difference between Asian male students with an IEP and Asian male students without an IEP; β_{11} is the difference between Black male students with an IEP and Black male students without an IEP; β_{12} is the difference between Hispanic male students with an IEP and Hispanic male students without an IEP; β_{13} is the difference between male students with an IEP and male students without an IEP who had no entry for race; β_{14} is the difference between students classified as Other race who had an IEP compared to those who did not; β_{15} is the difference between female students and male students; and ε_i is the random error for incident *i.*

We tested this model with each of the three measures of school days suspended (all days including expulsions, all suspensions, and short-term suspensions) for all four school levels and for both years of data. This resulted in 24 separate regression equations. Multicollinearity can be a problem in multiple regression. SPSS calculates tolerance values for multiple regressions. Generally, tolerance values less than 0.2 indicate that there may be multicollinearity between variables. Tolerance values for all but two variables in the model were greater than 0.2 for all school levels, both years, and all measures of exclusionary discipline. The exceptions were "Other" race and the interaction between "Other" race and IEP status for combined schools in

2013-14, and "required to be reported" and the interaction between "Required to be reported" and "Violent" for elementary schools in 2014-15. In both cases, the variables were retained in the model for ease of comparison between years and school levels.

Results for Question 4B

All final regression equations were significant ($p < .001$) with R^2 values between 0.037 (elementary schools in 2013-14) and 0.12 (high schools in 2014-15) for all days of exclusion; between 0.039 (elementary schools in 2013-14) and 0.097 (high schools in 2014-15) for all days of suspension; and between 0.05 (elementary schools in 2013-14) and 0.242 (high schools in 2014-15) for days of short-term suspension**.** This means that the variables in the regression account for between 3.7% and 24.2% of the variation in days of exclusionary discipline with more of the variation explained for short-term suspensions and for older students. Other factors such as school climate, presence of SROs, MOUs and use of zero-tolerance policies may be more important in explaining longer periods of exclusion from school. Exact values of F and R^2 for each regression equation are listed in Appendix F. Due to the large number of regression equations and the large number of factors, estimates for the regression coefficients are divided between three tables. Table 20 lists the estimated coefficients for all days of exclusionary discipline, Table 21 lists the coefficients for all days of suspension, and Table 22 lists the coefficients for short-term suspension days.

Table 20. *Regression Coefficients for All Days of Exclusionary Discipline*

	School Level							
	2013-14				2014-15			
Regression Coefficient	Elem (N = 32034)	Middle (N = 60161)	High (65564)	Combined (N = 3862)	Elem (N = 32028)	Middle (N = 57119)	High (N = 65364)	Combined (N = 4271)
β_0 (Mean School Days Suspended)	**1.73 ** [1.58, 1.93]**	**3.18** [2.91, 3.48]**	**3.83** [3.53, 4.11]**	1.28** [.48, 2.09]	1.75** [1.59, 1.91]	2.76** [2.49, 3.03]	3.59** [3.28, 3.91]	1.46** [.45, 2.48]
β_1 (Required)	**10.98** [8.06, 14.14]**	22.03** [19.53, 24.53]**	25.64** [23.92, 27.32]**	13.03** [7.71, 19.79]**	9.34** [8.75, 9.92]**	22.45** [21.75, 23.15]**	24.53** [23.91, 25.16]**	11.59** [9.38, 13.80]**
β_2 (Violent)	-.55** [-.62, -.47]**	.55** [.39, .72]**	2.95** [2.64, 3.25]**	.01 [-.50, .63]**	-.50** [-.64, -.36]**	.59** [.37, .80]**	3.29** [2.92, 3.65]**	1.11** [.21, 2.01]**

β_3 (Violent Required Interaction)	-9.60** [-12.84, -6.74]	-14.63** [-17.37, -11.77]	-13.99** [-16.16, -11.82]	-1.26 [-8.21, 5.14]	-7.38** [-8.04, -6.72]	-12.51** [-13.38, -11.64]	-11.07** [-12.05, -10.08]	-2.72 [-5.48, .04]
β_4 (Asian)	-.38* [-.70, -.09]	-.88 [-2.16, .933]	-2.72** [-4.47, -.73]	-3.32* [-6.38, -.73]	-.43 [-1.33, .46]	-1.18 [-2.58, .22]	-2.92** [-4.72, -1.12]	.03 [-4.33, 4.40]
β_5 (Black)	**.58**** [.38, .78]	**.60**** [.25, .91]	**.95**** [.54, 1.42]	4.21** [3.08, 5.51]	.59** [.40, .78]	1.11** [.81, 1.41]	.98** [.60, 1.36]	3.73** [2.62, 4.84]
β_6 (Hispanic)	-.20 [-.45, .09]	-.30 [-.91, .31]	-.26 [-1.06, .54]	1.19 [-1.06, 4.64]	-.06 [-.40, .29]	-.31 [-.78, .17]	-1.10* [-1.76, -.44]	-.62 [-3.02, 1.79]
β_7 (Missing)	.32 [.-.07, .79]	.55 [-.23, 1.58]	.27 [-.88, 1.41]	2.37 [-.18, 5.96]	.33 [-.06, .71]	.55 [-.10, 1.20]	.16 [-.75, 1.07]	.68 [-2.23, 3.58]
β_8 (Other)	2.61	.03	-.99	-.29	-.40	.15	-1.59	-.86

	[-1.00, 9.85]	[-2.01, 3.11]	[-3.29, 1.82]	[-1.09, .52]	[-1.85, -1.05]	[-1.97, 2.27]	[-4.00, .82]	[-9.99, 8.26]
β_9 (IEP)	.00 [-.22, .22]	**-.98**** [-1.36, -.63]	**-1.71**** [-2.10, -1.29]	.20 [-.84, 1.14]	.09 [-.15, .33]	**-1.06**** [-1.44, -.69]	**-1.74**** [-2.19, -1.30]	-.78 [-2.10, .55]
β_{10} (Asian IEP Interaction)	.37 [-.07, .82]	.07 [-2.45, 2.72]	-.51 [-2.68, 1.70]	3.41* [.87, 6.69]	-.12 [-1.62, 1.38]	-.35 [-3.12, 2.43]	.38 [-2.80, 3.55]	-.75 [-8.97, 7.48]
β_{11} (Black IEP Interaction)	-.15 [-.40, .11]	-.12 [-.52, .32]	-.38 [-.91, .16]	-3.38** [-5.34, -1.77]	-.34* [-.64, -.05]	-.03 [-.49, .43]	.03 [-.56, .62]	-2.77** [-4.55, -.98
β_{12} (Hispanic IEP Interaction)	.24 [-.15, .69]	.24 [-.52, 1.02]	-.16 [-1.14, .86]	-1.65 [-5.29, .78]	-.38 [-.95, .18]	.02 [-.76, .79]	.67 [-.36, 1.69]	.46 [-2.88, 3.79]

β_{13} (Missing IEP Interaction)	.01 [-.58, .71]	-.21 [-1.40, .94]	-.78 [-2.19, .64]	-1.72 [-5.50, 1.62]	-.46 [-1.05, .13]	-.09 [-1.13, .95]	.65 [-.82, 2.11]	-.90 [-5.33, 3.53]
β_{14} (Other IEP Interaction)	-2.77 [-10.24, 1.00]	-1.12 [-4.33, 1.04]	1.55 [-1.91, 4.41]	.98 [-.42, 2.49]	1.19 [-.82, 3.20]	-.27 [-3.49, 2.94]	.52 [-3.61, 4.65]	1.57 [-9.32, 12.46]
β_{15} (Female)	-.18* [-.32, -.05]	-.19 [-.39, .00]	-.96** [-1.23,-.70]	.08 [-1.00, 1.08]	-.24** [-.40, -.07]	-.05 [-.28, .17]	-.94** [-1.23, -.64]	-.41 [-1.37, .55]

Table 21. *Regression coefficients for all days of suspension (1-179 school days)*

	School Level							
	2013-14				2014-15			
Regression Coefficient	Elem (N = 32024)	Middle (N = 60082)	High (N = 65299)	Combined (N = 3848)	Elem (N = 32020)	Middle (N = 57018)	High (N=65063)	Combined (N = 4258)
β_0 (Mean School Days Suspended)	1.72** [1.61, 1.85]	**3.09**** [2.85, 3.36]	**3.44**** [3.19, 3.72]	1.27** [.78, 1.85]	1.76** [1.61, 1.91]	2.65** [2.42, 2.87]	3.24** [2.99, 3.48]	1.70** [1.00, 2.41]
β_1 (Required)	8.39** [6.24, 10.86]	**16.65*** [14.69, 19.08]	17.44** [16.22, 18.75]	7.96** [5.11, 11.81]	8.44** [7.92, 8.95]	15.83** [15.25, 16.41]	16.09** [15.60, 16.58]	9.15** [7.60, 10.70]
β_2 (Violent)	-.56** [-.64, -.48]	.56** [.42, .71]	2.75** [2.49, 3.03]	-.03 [-.44, .31]	-.47** [-.59, -.35]	.55** [.37, .72]	2.89** [2.60, 3.17]	.65* [.02, 1.28]

β_3 (Violent Required Interaction)	-7.10** [-9.66, -4.88]	-10.10** [-12.58, -8.01]	-7.90** [-9.64, -6.21]	.35 [-4.58, 4.38]	-6.82** [-7.40, -6.24]	-7.70** [-8.42, -6.98]	-5.50** [-6.27, -4.73]	-3.59** [-5.53, -1.65]
β_4 (Asian)	-.34** [-.59, -.06]	-1.33** [-2.05, -.41]	-1.93** [-2.97, -.53]	-1.45 [-3.15, .16]	-.44 [-1.22, .34]	-.84 [-1.98, -.31]	-1.98** [-3.37, -.59]	.61 [-2.43, 3.66]
β_5 (Black)	.60** [.43, .76]	.53** [.22, .81]	1.05** [.72, 1.36]	3.44** [2.74, 4.20]	.48** [.31, .64]	1.03** [.79, 1.28]	.80** [.51, 1.09]	2.74** [1.97, 3.52]
β_6 (Hispanic)	-.09 [-.31, .14]	-.23 [-.71, .29]	.01 [-.61, .67]	.40 [-.34, 1.12]	-.06 [-.36, .25]	-.11 [-.50, .28]	-.54* [-1.05, -.03]	-.38 [-2.06, 1.30]
β_7 (Missing)	.39 [.05, .88]	.61 [-.21, 1.60]	.62 [-.32, 1.65]	2.71 [.40, 7.08]	.15 [-.18, .49]	.74** [.21, 1.27]	.33 [-.37, 1.03]	.93 [-1.09, 2.96]
β_8 (Other)	-.28	-1.13**	-.79	-.27	-.40	.47	-1.27	-.60

	[-.90, .28]	[-1.71, -.59]	[-2.41, 1.35]	[-.85, . 22]	[- 1.66, .87]	[-1.26, 2.20]	[- 3.13, .6 0]	[-6.96, 5.77]
β_9 (IEP)	-.03 [-.18, .11]	-.97** [-1.29, --.67]	-1.39** [-1.71, -1.06]	.47 [-.15, 1.10]	.10 [-.11, .30]	-.91** [-1.21, -.60]	-1.46** [-1.80, -1.11]	-.60 [- 1.53, .3 2]
β_{10} (Asian IEP Interaction)	.38 [-.03, .77]	.85 [-1.12, 3.67]	-.53 [-2.17, 1.22]	1.87* [.11, 3.82]	-.10 [-1.41, 1.21]	-.34 [-2.60, 1.92]	.29 [-2.16, 2.73]	-.52 [-6.26, 5.22]
β_{11} (Black IEP Interaction)	-.15 [-.35, .05]	-.06 [-.41, . 32]	-.49* [-.90, -.07]	-3.00** [-4.08, -1.81]	-.24 [-.50, .02]	-.22 [-.60, . 16]	.10 [-.36, . 55]	-1.75** [-3.00, -.51]
β_{12} (Hispanic IEP Interaction)	.21 [-.16, .66]	.27 [-.41, . 92]	-.32 [- 1.12, .4 7]	-.83 [- 1.92, .2 2]	-.38 [-.11, .30]	-.03 [-.66, . 60]	.34 [-.45, 1.14]	.35 [-1.98, 2.67]

β_{13} (Missing IEP Interaction)	-.01 [-.59, .65]	-.43 [-1.57, .52]	-.82 [-2.07, .38]	-2.20 [-6.64, 1.46]	-.28 [-.80, .23]	-.45 [-1.30, .40]	.69 [-.44, 1.82]	-1.30 [-4.39, 1.79]
β_{14} (Other IEP Interaction)	.25 [-.48, 1.03]	.22 [-.53, .95]	1.72 [-1.03, 4.25]	.69 [-.57, 2.01]	1.20 [-.55, 2.95]	-.48 [-3.10, 2.14]	.63 [-2.56, 3.81]	1.28 [-6.31, 8.88]
β_{15} (Female)	-.16** [-.27, -.05]	-.07 [-.26, .12]	-.70** [-.92, -.50]	.42 [-.33, 1.18]	-.17* [-.31, -.03]	.12 [-.07, .30]	-.57** [-.79, -.34]	-.37 [-1.04, .30]

Table 22. *Regression coefficients for short-term suspension days (1-10 school days)*

	School Level							
	2013-14				2014-15			
Regression Coefficient	Elem (N = 31864)	Middle (N=58812)	High (N=63054)	Combined (N=3728)	Elem (N=31833)	Middle (N=55835)	High (N=63171)	Combined (N=4104)
β_0 (Mean School Days Suspended)	1.66** [1.61, 1.71]	2.25** [2.21, 2.30]	2.23** [2.19, 2.27]	1.56** [1.40, 1.72]	1.64** [1.59, 1.69]	2.21** [2.16, 2.26]	2.25** [2.21, 2.30]	1.50** [1.36, 1.65]
β_1 (Required)	2.69** [2.32, 3.05]	4.23** [3.97, 4.45]	4.46** [4.31, 4.63]	2.40** [1.60, 3.17]	2.04** [1.86, 2.21]	3.99** [3.84, 4.14]	3.59** [3.50, 3.69]	2.07** [1.71, 2.42]
β_2 (Violent)	-.50** [-.53, -.46]	.48** [.44, .52]	2.08** [2.02, 2.14]	.12 [-.03, .30]	-.46** [-.50, -.43]	.57** [.53, .61]	2.13** [2.08, 2.18]	-.11 [-.25, .02]

β_3 (Violent Required Interaction)	-1.87** [-2.26, -1.47]	-2.70** [-2.95, -2.42]	-2.92** [-3.15, -2.71]	-.89* [-1.75, .03]	-1.38** [-1.57, -1.19]	-2.90** [-3.09, -2.72]	-2.31** [-2.46, -2.16]	-1.13** [-1.58, -.69]
β_4 (Asian)	-.27** [-.46, -.06]	-.76** [-.99, -.51]	-.19 [-.47, .10]	.74 [-.21, 1.70]	-.14 [-.39, .10]	-.49** [-.75, -.23]	-.35* [-.61, -.10]	.25 [-.42, .92]
β_5 (Black)	.43** [.37, .48]	.57** [.51, .63]	.77** [.71, .82]	1.68** [1.45, 1.88]	.41** [.36, .47]	.68** [.62, .73]	.61** [.55, .66]	1.46** [1.29, 1.62]
β_6 (Hispanic)	-.06 [-.15, .03]	-.03 [-.13, .06]	.01 [-.08, .11]	.11 [-.32, .51]	.00 [-.09, .10]	-.16** [-.25, -.07]	-.06 [-.15, .03]	.27 [-.09, .62]
β_7 (Missing)	.21** [.11, .33]	.14* [.02, .28]	.26** [.12, .41]	.89** [.36, 1.43]	.08 [-.02, .19]	.32** [.20, .44]	.13* [.00, .26]	1.04** [.61, 1.47]
β_8 (Other)	.06 [-.38, .65]	.11 [-.31, .47]	.37 [-.03, .86]	-.56** [-.72, -.40]	-.03 [-.43, .36]	.03 [-.37, .42]	.24 [-.10, .58]	.47 [-.85, 1.80]

β_9 (IEP	-.01	-.43**	-.44**	-.11	.05	-.39**	-.44**	.04
	[-.08, .05	[-.49,	[-.50,	[-.29, .	[-.01, .12	[-.46,	[-.50,	[-.16, .
	]	-.37]	-.39]	08]	]	-.32]	-.37]	23]
β_{10} (Asian	.34	.31	-.74**	.61	-.11	.12	-.21	1.5*
IEP	[.00, .71]	[-.12, .	[-1.17,	[-.86,	[-.52, .30	[-.41, .	[-.66, .	[.23,
Interaction		78]	-.34]	2.46]	]	64]	23]	2.79]
)								
β_{11} (Black	-.09*	-.14**	-.32**	-.79**	-.16**	-.24**	-.27**	-1.04**
IEP	[-.17,	[-.22,	[-.40,	[-1.07,	[-.25,	[-.32,	[-.35,	[-1.30,
Interaction	-.01]	-.07]	-.25]	-.48]	-.08]	-.15]	-.19]	-.78]
)								
β_{12}	.03	-.01	-.32**	.08	-.15	.04	-.16*	-.27
(Hispanic	[-.11, .18	[-.14, .	[-.45,	[-.39, .	[-.30, .01	[-.10, .	[-.31,	[-.77, .
IEP	]	14]	-.20]	58]	]	19]	-.02]	22]
Interaction								
)								
β_{13}	-.02	.04	-.34	-.88*	.04	-.27**	-.15	-1.45**
(Missing								

IEP Interaction)	[-.17, .15]	[-.14, .21]	[-.55, -.14]	[-1.56, -.23]	[-.13, .20]	[-.47, -.08]	[-.35, .06]	[-2.10, -.80]
β_{14} (Other IEP Interaction)	.14 [-.51, .75]	-.38 [-.83, .12]	.62 [-.13, 1.34]	1.22 [.24, 2.42]	.14 [-.41, .69]	.37 [-.23, .97]	-.06 [-.63, .51]	-.72 [-2.33, .89]
β_{15} (Female)	-.06* [-.11, -.02]	.04 [-.01, .08]	-.07** [-.11, -.03]	.36** [.19, .54]	-.11** [-.15, -.07]	.07** [.02, .11]	-.02 [-.06, .03]	.08 [-.06, .22]

Next, we outline trends in the regression results. Generally, the numbers changed little from the 2013-14 to the 2014-15 school year. Therefore, unless stated otherwise, these trends hold over both school years. Specific numerical values are found in the Tables 21-23. In general, middle and high school students who commit an offense are excluded from school for about twice as many school days as students in elementary or combined schools. While middle and high school students are excluded for about the same number of days for offenses that result in short-term suspensions, high school students tend to be excluded for longer periods (about 0.5 to 0.75 more days) for long-term suspensions.

Offenses that are nonviolent and required to be reported to law enforcement result in many more days of exclusionary discipline than offenses which are not required to be reported. When considering all days of exclusionary discipline, nonviolent required reporting offenses result in between about 9 and 26 more school days missed with the lower number for elementary and combined schools and the upper number for middle and high schools. When we consider only suspension days in the analysis, the number of additional days of exclusion falls to between about 8 and 16 and for only short-term suspensions, the number of additional days falls further to between about 2 and 4.5. In each case, middle and high school students receive about twice as many additional days for nonviolent required-to-report offenses as elementary and combined students.

Offenses that are violent but not required to be reported result in about 0.5 fewer days of exclusionary discipline for elementary students, about 0.5 more days for middle school students, and about 2 to 3.5 more days for high school students. Combined schools showed no significant difference in exclusionary discipline days for violent non-required offenses in 2013-14 and just over 1 more day when considering all days of exclusionary discipline for 2014-15, but there is no pattern visible in the results for these schools.

Violent offenses which are required to be reported result in fewer days of exclusionary discipline than nonviolent offenses which are required to be reported. The difference is smallest for elementary students-- about 2 (short-term suspension only) to about 9 fewer (all exclusionary discipline) days--and largest for high school students--about 0.5 (short-term suspension) to about 11 fewer (all exclusionary discipline) days. The pronounced difference for nonviolent required-to-report offenses and violent required to be reported offenses may be the result of mandatory

requirements of large number of days of exclusionary discipline for drug and alcohol offenses which fall into the first category.

When considering all days of exclusionary discipline, black students in elementary, middle, and high schools who commit offenses are excluded from school for about 0.6 to 1.1 more days than white students. For black students at combined schools, this difference is more than tripled to between 3.7 and 4.2 more days than white students. A similar pattern holds when we consider long- and short-term suspensions or only short-term suspensions. Further research into differences between combined and other schools may help to explain this anomaly. The other significant difference by race is that Asian students are assigned fewer days of exclusionary discipline than any other group.

Finally, students with an IEP in middle and high schools are excluded from school for fewer days than students without an IEP. This difference ranges from about 0.40 fewer days for short-term suspensions to between 1 and 1.5 fewer days for short- and long-term suspension days. This is most likely due to protections that are in place for some students with individualized education plans (IEPs) or 504 plans. These protections make suspending or expelling students with IEPs or 504 plans more difficult.

Research Question 5: To what extent do each of the influences of school climate, school safety, threat assessment, and cultural background contribute to the STPP in Virginia?

> *Hypothesis 5: We anticipate that an ecological model of influences will show contributions from school climate, school safety, threat assessment, and cultural background.*

To address this research question, we hypothesized a conceptual path diagram (shown in the figures below) to represent the STPP at the school building level by modifying the conceptual diagram presented in Skiba, Arredondoa, and Williams (p.552, 2014) at the individual level. Our outcome variables were appearance at intake (i.e., Went Intake Officer/1,000 students (WIO)) and on-time graduation rate and our key independent variable was Use of Exclusionary discipline (UED), which was operationalized as the average suspension/expulsion days for the school by calculating expulsion as 180 days (school days of one academic year) of suspension. We used Gang Activity (Gang), Prevalence of Teasing and Bullying (PTB), exogenous variables, School Climate (School Climate 2), Mathematics SOL (Standard of Learning) pass rate, and English (reading and writing combined) SOL pass rate as mediators. Note that threat assessment was not used in the analysis because of the difficulty of locating the role that this variable may play in the STPP process. Also, in this analysis, School Climate 2 was used in the analysis as a global school climate variable by combining school's support and structure climates with students' engagement level because those three constructs were highly correlated at the school level and separating the unique effects of each construct was not possible. Data for on-time graduation rate and SOL pass rates come from the Virginia Department of Education. Data for the other variables used in this question have been described in earlier sections of this paper.

In order to answer the research question, we conducted a path analysis for 306 (*N)* high schools in Virginia that had information on all the variables used in the analysis for the academic year 2013-2014. Table 23 shows the descriptive statistics for the variables used in the analysis.

Table 23. *Descriptive Statistics for the variables used in R.Q.5*

Variable Name	Description	N	Min.	Max.	Mean	S.D.
WIO	Appearance at Intake per 1000 students	306	.00	87.79	5.76	7.10
GradRate	On-time Graduation Rate	305	35.1	100.0	90.05	6.20
UED	All Exclusionary discipline suspension days /1000 students (Index of use of exclusionary discipline)	306	21.05	6763.36	1068.61	1002.32
Gang	Gang Activity	304	.0034	.4767	.1057	.07887
PTB	Prevalence of Teasing and Bullying (PTB_E + PTB_P)	304	2.69	4.33	3.68	.25
SClimate2	Global School Climate	304	15.94	20.57	17.97	.81

	(SDS+SSup+SEngage)					
Mathematics SOL Pass Rate	Mathematics SOL Pass Rate	306	.382	1.00	.75	.11
English SOL Pass Rate	English SOL Pass Rate (Average of Reading & Writing)	306	.48	1.00	.85	.076
TotalStudents	Total Number of Students (Enrollment)	306	93	3324	1202.42	659.51
Percent Disadvantaged	Pct Disadvantaged (Free/Reduced Lunch)	306	1.9	83.1	37.56	18.96
Percent IEP	Pct with an IEP	306	.8	34.7	12.54	3.90
Proportion of White	Proportion of White Students in the School	306	.022	1.00	.61	.26

Proportion of Black	Proportion of Black Students in the School	306	.000	.97	.23	.23
Proportion of Hispanic	Proportion of Hispanic Students in the School	306	.000	.52	.08	.098
Proportion of Asian	Proportion of Asian Students in the School	306	.000	.61	.04	.066
Proportion of other	Proportion of Other Students in the School	306	.000	.11	.04	.02
dFullTSRO	dummy for Full-time SRO	306	0	1	.92	.26
d_has_ZT	School System has ZT Policy (dummy)	306	.00	1.00	.56	.50
d_U_ZT	Used zero-tolerance policy to expel student (dummy)	306	.00	1.00	.19	.39

MOU	dummy for MOU	306	.00	1.00	.82	.38

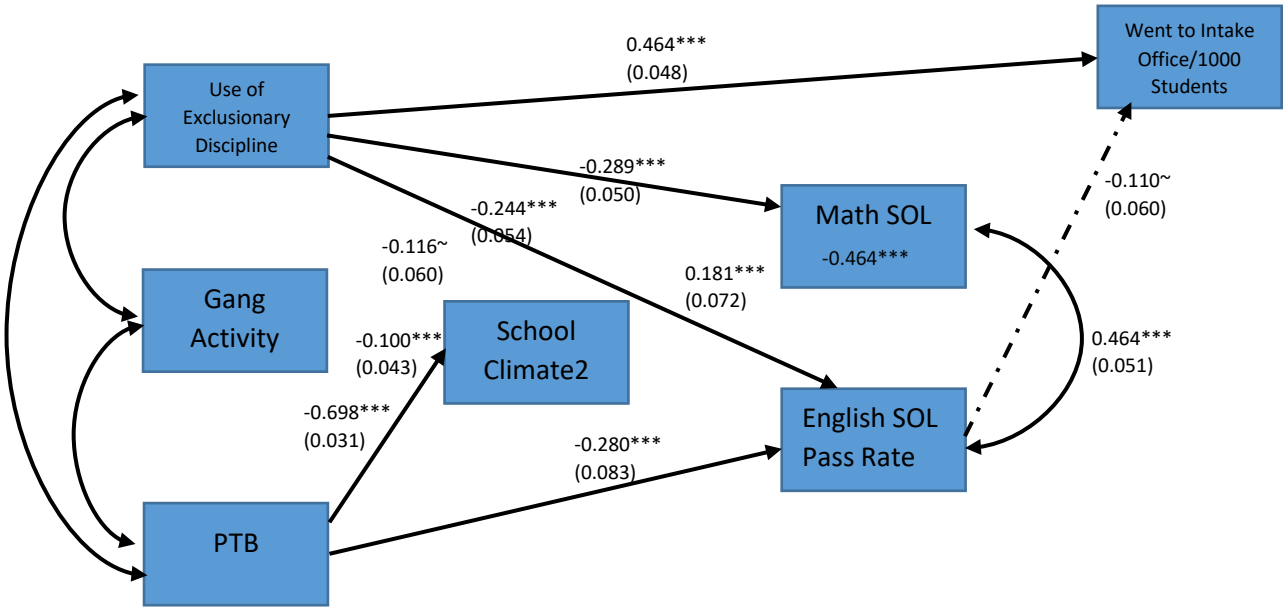
As seen from the table, for each dependent variable, appearance at intake (WIO) had a mean of 5.76 (number of times a student appeared at intake officer per 1000 students in 2013-14 school year) and the average on-time graduation rate was 90.05%. Use of exclusionary discipline (UED) as suspension days per 1000 students had a mean of 1068.61, which equates to 1.07 days per student in a school year. Ninety-two percent of the high schools in Virginia had a fulltime SRO and 82% of the high schools were in districts which had an MOU. Though 56% of the high schools had a zero-tolerance policy, only 19% of the schools actually used the policy at least once during the school year. In the table, there is information on other variables such as school safety variables represented by gang activity (Gang) and prevalence of teasing and bullying (PTB), global school climate variable (SClimate2), Mathematics and English SOL pass rates, enrollment, percentage of disadvantaged students (percent of students with free/reduced lunch), percentage of students with an IEP, and proportion of student's racial/ethnic category (White, Black, Hispanic, Asian, and other group).

To conduct a path analysis, the Bayesian estimation method was chosen to obtain a stable result. The number of schools used for the analysis was $N = 304$ because two schools had missing cases in some of the variables in the model.

Figure 13 summarizes the result for appearance at intake (WIO) as the outcome variable. The coefficients are standardized and the numbers in the parentheses are the corresponding standard errors. The key findings are:

1. The higher the use of exclusionary discipline in schools (UED), the higher the appearance at intake rate (WIO). There is a strong direct effect of use of exclusionary discipline (standardized path coefficient = 0.464, $p < 0.001$). UED is actually the sole variable that had a statistically significant direct effect among three exogenous variables (UED, Gang Activity, and PTB).
2. There was no statistically significant indirect path found. A potential weak path from UED to WIO is through English SOL pass rate.

Note. $R^2 = 0.303$ and the posterior predictive p-value (ppp) was 0.417, which was considered to be a good model data fit where a ppp around 0.5 indicates an excellent fit (Műten & Asparounov, 2012).



Note. *** p<0.001, ** p < 0.01, * p <0.05, ~ p <0.10; all the coefficients are standardized and the number in parenthesis is the standard error; $R^2 = 0.303$; ppp = 0.417, $N = 304$.

Fig. 13. Path Analysis Results for Appearance at Intake (Went Intake Officer/1,000 students) as Outcome

(2) Regression analysis of appearance at intake with other variables added

To further investigate whether this direct effect of UED on appearance at intake remains even after controlling for school characteristics such as total number of students enrolled, we conducted a multiple linear regression analysis. The additional variables that were included in the model are: racial proportions of the school (percentage of Black, Hispanic, Asian, and Other race/ethnicity), proportion of students with an IEP, percentage of disadvantaged students measured by the proportion of students who received free/reduced lunch, whether school has a full-time SRO, whether the school has a zero-tolerance policy, and whether the school has a memorandum of understanding (MOU). For ease of interpretation, all the independent variables except d_U_ZT (indicator for having used zero-tolerance policy) were centered. The results are presented in Table 1. First, we observe that 38.1 % of total variation in conviction rate can be explained by the set of independent variables in the model ($R^2 = 0.381$). The direct effect of UED on appearance at intake (i.e., WIO) was still highly statistically significant (unstandardized coefficient = 0.004, $p < 0.001$) and was also practically important (standardized coefficient =

0.600) with slightly larger magnitude than the path analysis (path coefficient = 0.464). Interestingly, it was found that UEO interacted with the zero-tolerance policy used (unstand. coeff. = -0.003, stand. coeff. = -0.186, *p*-value = 0.002). This negative sign combined with the positive sign of the statistically and practically significant main effect of UED (i.e., Suspension days) and non statistically significant main effect of d_U_ZT (indicator of used zero-tolerance policy) indicated that only for the schools which did not use the zero-tolerance policy, did UED have a strong association with the dependent variable (i.e., appearance at intake) controlling for other independent variables in the model. For the schools that used their zero-tolerance policy, UED did not have a significant association with the outcome variable. Since the majority of the high schools in the data did not use the zero-tolerance policy (i.e., only 18.6 % of the schools used it though 55.6% had the policy), the result implied that for about 80% of the schools, the use of exclusionary disciplines (UED) had a strong positive association with appearance at intake. That is, the higher the use of exclusionary discipline, the higher the appearance at intake.

Additionally, we found that the direct effect of English SOL pass rate became statistically significant at 0.05 level (stand. coeff = - 0.156) in the regression. In the path analysis it was statistically significant only at 0.1 level and the standardized coefficient was slightly lower (stand. coeff. = -0.110, see Figure 1). Further, the coefficients for proportion for disadvantaged students (Percent Free/Reduced Lunch, stand. coeff = - 0.204), the proportion of students with an IEP (Percent IEP, stand. coeff = 0.176), and the dummy variable for full-time SRO (stand. coeff = 0.147) exhibited statistically significant partial associations at the 0.05 level. The positive signs of the proportion of disadvantaged students and SRO were expected, but the negative sign of the proportion of disadvantaged students was unexpected. This requires further investigation of why the statistically significant negative sign emerged. None of the other independent variables such

as proportion of Black, Hispanic, Asian, and Other students, MOU indicator, Math SOL pass rate, global schools climate (School Climate2), prevalence of teasing and bullying (PTB), and Gang Activity exhibited statistically significant associations once other independent variables in the model were controlled for.

Table 24. Multiple regression results for conviction rate as outcome variable with additional school level covariates

ANOVA for Regression

Source	Sum of Squares	df	Mean Square	F	P-value
Regression	5793.657	17	340.803	10.369	<0.001
Residual	9400.166	286	32.868		
Total	15193.823	303			

Note. The sample size went down to *N* =304 from *N*= 306 because of the missing cases in the added covariates; $R^2 = 0.381$.

Regression coefficients

Variable	Unstandardized coefficient	s.e.	Standardized coefficient	t	P-value
Intercept	6.101	0.369		16.549	<0.001
Suspension Days (UED)	.0004	<0.001	0.600	8.439	<0.001
Used Zero-tolerance Policy (d_U_ZT)	-0.591	0.944	-0.032	-0.626	0.532

Suspension Days by Used Zero-tolerance Policy Interaction (UED x d_U_ZT)	-0.003	0.001	-0.186	-3.151	0.002
Gang Activity	1.979	6.358	0.022	0.311	0.756
PTB	1.726	2.436	0.062	0.708	0.479
School Climate2	0.882	0.700	0.101	1.260	0.209
Math SOL Pass Rate	-4.970	4.022	-0.078	-1.236	0.218
English SOL Pass Rate	-15.052	7.427	-0.156	-2.027	0.044
Enrollment	-0.001	0.001	-0.119	-1.509	0.132
Percent Free/Reduced Lunch	-0.076	0.032	-0.204	-2.356	0.019
Percent IEP	0.318	0.099	0.176	3.226	0.001
Proportion of Black Students	-1.245	2.475	-0.040	-0.503	0.615
Proportion of Hispanic Students	3.022	4.741	0.041	0.637	0.524
Proportion of Asian Students	7.979	6.842	0.074	1.166	0.245

Proportion of Other Students	-20.094	17.456	-0.067	-1.151	0.251
Full-time SRO indicator	3.918	1.407	0.147	2.785	0.006
MOU indicator	0.029	0.929	0.002	0.031	0.975

On-time Graduation Rate as Outcome Variable

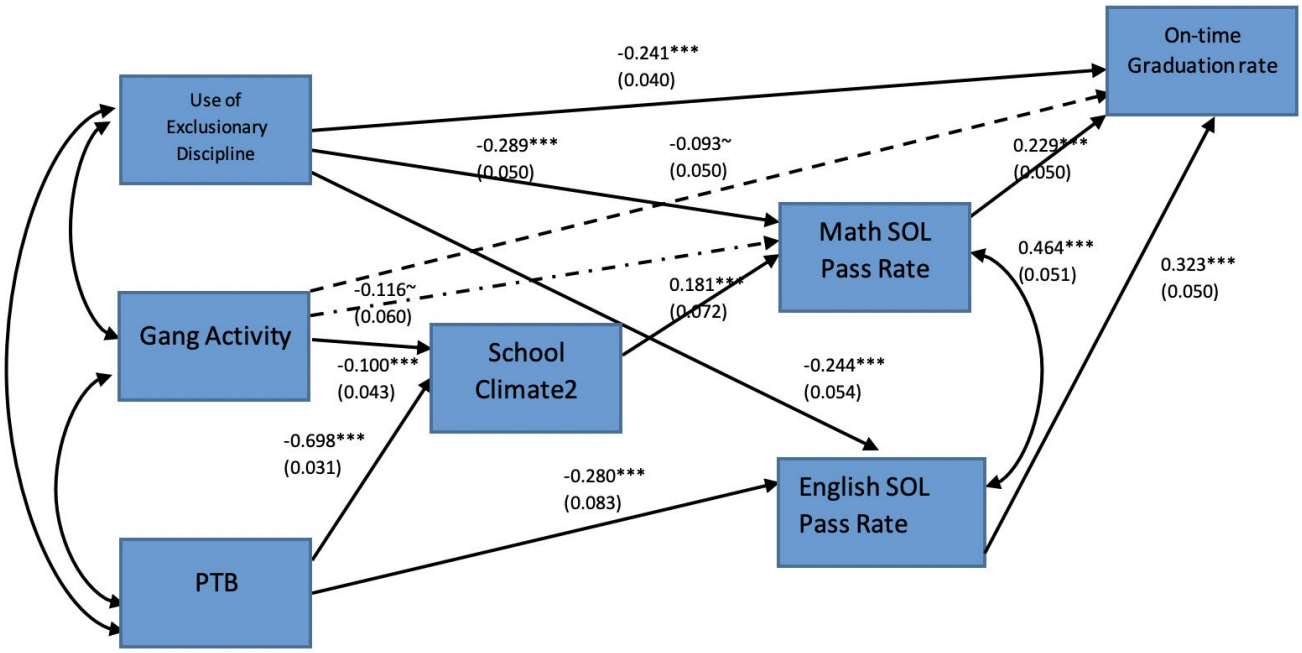
(1) Path Analysis

Figure 13 summarizes the result for on-time graduation rate as the outcome variable. The coefficients are standardized and the number in the parentheses are the corresponding standard errors. The key findings are:

1. The higher the use of exclusionary discipline in schools (UED), the lower the on-time graduation rate. There is a moderate direct effect of use of exclusionary discipline (standardized path coefficient = -0.241, $p < 0.001$). UED is the sole variable that had statistically significant direct effect among three exogenous variables (UED, Gang Activity, and PTB). There could be a weak direct effect of gang activity on on-time graduation rate (stand. coeff. = -0.094, $p < 0.10$, two-tailed).
2. There was one statistically significant indirect path found along with two potential weak paths from UED to WIO through English SOL pass rate and through Math SOL pass rate. The mechanism of this SOL pass rate mediation is that the higher the use of exclusionary discipline (UED), the lower the Math and English SOL pass rate, and in turn, the on-time graduation rate gets lower. English seems to have slightly stronger influence on on-time graduation rate than Math.

3. Gang activity and PTB were found to have indirect influence on on-time graduation though school climate and Math SOL pass rate, for PTB, through English SOL pass rate.

Note. $R^2 = 0.500$ and the posterior predictive p-value was 0.417, which were considered to be a very good model data fit.



Note. *** p<0.001, ** p < 0.01, * p <0.05, ~ p <0.10; all the coefficients are standardized and the number in ( ) is the standard error; R^2 = 0.501; ppp = 0.417; *N* =304.

Fig. 14. Path Analysis Results for On-time Graduation rate as Outcome

(2) Regression analysis of on-time graduation rate with other variables added

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To further investigate whether this direct effect of UED on on-time graduation rate remains even after controlling for school characteristics such as total enrollment, we conducted a multiple linear regression analysis. The additional variables that were included in the model are: racial proportions of the school (proportion of Black, Hispanic, Asian, and Other race/ethnicity), proportion of students with an IEP, proportion of disadvantaged students measured by the proportion of students who received free/reduced lunch, whether school has a full-time SRO, whether the school has a zero-tolerance policy, and whether the school has a memorandum of understanding (MOU). For ease of interpretation, all the independent variables except d_U_ZT (indicator for having used zero-tolerance policy) were centered. The results are presented in Table 2. First, we observe that 60.0 % of total variation in on-time graduation rate can be explained by the set of independent variables in the model (R^2=0.600). The direct effect of UED on on-time graduation rate was still highly statistically significant (unstandardized coefficient = - 0.002, $p < 0.001$) and also practically important (standardized coefficient = - 0.340) with about 40% larger magnitude than the path analysis (path coefficient = - 0.241). Interestingly, it was found that UEO interacted with the zero-tolerance policy used (unstand. coeff. = 1.047, stand. coeff. = 0.065, *p*-value = 0.002). This positive sign combined with the negative sign of the the statistically and practically significant main effect of UED and non statistically significant main effect of d_U_ZT (indicator of used zero-tolerance policy) indicated that only for the schools which did not use a zero-tolerance policy, did UED have a strong association with the dependent variable (i.e., on-time graduation rate) controlling for other independent variables in the model. For the schools that used their zero-tolerance policy, UED did not have a significant association with the outcome variable. Since the majority of the high schools in the data did not use a zero-tolerance policy (i.e., only 18.6 % of the schools used it though 55.6% had the policy), the result

implied that for about 80% of the schools, the use of exclusionary disciplines (UED) had strong positive association with on-time graduation rate. That is, the higher the use of exclusionary discipline, the lower the on-time graduation rate.

Additionally, we found that the direct effect of Math SOL pass rate (stand. coeff = 0.178) and English SOL pass rate (stand. coeff = 0.179) were still statistically significant at 0.05 level and the magnitudes are slightly lower than the ones in the path analysis. The direct effect of PTB (stand. coeff = - 0.146) emerged statistically significant while it was not in the path analysis. In terms of additional covariates, it was found that the proportion of disadvantaged students (i.e., Percent Free/Reduced Lunch) (stand. coeff = - 0.321) and proportion of Hispanic students (stand. coeff = - 0.108) were statistically significant. The directions of the relationships of these variables with the dependent variable (i.e., on-time graduation rate) were as we expected. Other variables such as Gang activity, School Climate2, Percent IEP, Percent of Black, Hispanic, Asian, and Other Students, Full-time SRO indicator, and MOU indicator did not have statistically significant partial associations with the dependent variable.

Table 25. Multiple regression results for on-time graduation rate as outcome variable with additional school level covariates

ANOVA for Regression

Source	Sum of Squares	df	Mean Square	F	P-value
Regression	7003.626	17	411.978	25.235	<0.001

Residual	4669.228	286	16.326
Total	1672.853	303	

Note. The sample size went down to N =304 from N = 306 because of the missing cases in the added covariates; $R^2 = 0.600$.

Regression coefficients

Variable	Unstandardized coefficient	s.e.	Standardized coefficient	t	P-value
Intercept	89.612	0.260		344.889	<0.001
Suspension Days (UED)	-0.002	<0.001	-0.340	-5.950	<0.001
Used Zero-tolerance Policy (d_U_ZT)	1.047	0.665	0.065	1.573	0.117
Suspension Days by Used Zero-tolerance Policy Interaction (UED x d_U_ZT)	0.002	0.001	0.180	3.781	<0.001
Gang Activity	-3.179	4.481	-0.040	-0.710	0.479
PTB	-3.570	1.717	-0.146	-2.079	0.038
School Climate2	-0.745	0.494	-0.097	-1.510	0.132

Math SOL Pass Rate	10.004	2.835	0.178	3.529	<0.001
English SOL Pass Rate	12.685	5.234	0.150	2.423	0.016
Enrollment	<0.001	0.001	0.023	0.364	0.716
Percent Free/Reduced Lunch	-0.105	0.023	-0.321	-4.612	<0.001
Percent IEP	-0.023	0.069	-0.015	-0.337	0.736
Proportion of Black Students	0.164	1.745	0.006	0.094	0.925
Proportion of Hispanic Students	-6.889	3.342	-0.108	-2.061	0.040
Proportion of Asian Students	-0.768	4.822	-0.008	-0.159	0.874
Proportion of Other Students	-20.116	12.302	-0.077	-1.635	0.103
Full-time SRO indicator	-0.134	0.992	-0.006	-0.135	0.892
MOU indicator	-0.801	0.655	-0.049	-1.224	0.222

Appendix A—Matching Offense Codes (DCV and DJJ)

Common Offense Category	DCV Offense Category	DJJ Offense Codes (VCC Head)
1	Alcohol	ALC
2	Arson/Actual/Attempted	ARS
3	Assault Harassment Hazing Bullying (Bullying) Fighting/Conflict	ASL
4	Robbery/Person/Force or Threat of Force Theft/No Force	LAR ROB
5	Weapons	WPN
6	Breaking and Entering/Burglary	BUR
7	Extortion	EXT STK

8	Gang Activity	MOB
9	Drug Violations	NAR TST
10	Sexual Offense Stalking	RAP SEX
11	Trespassing	TRS
12	Vandalism Technology Violations (Damaging Computer)	VAN
13	Threats/Verbal/Physical Disorderly Conduct (Abusive Language) Bullying (Cyber Bullying)	ABU
14	Disorderly Conduct (Disruption, Definance of Authority, Disrespect/Walking Away, Disruptive Demonstrations, Minor Insubordination)	DIS

15	Other Violations (Misrepresentation—altering notes, false information, cheating, etc.)	FRD

Appendix B—Violent and Nonviolent Offenses

Violent Offenses	Nonviolent Offenses
Assault/Battery	Alcohol
Bomb Threat	Arson
Bullying	Attendance
Extortion	Breaking and Entering/Burglary
Fighting/ Conflict/ Altercation	Cyberbullying
Gang Activity	Disorderly Conduct
Harassment	Drug Violations/Tobacco
Hazing	Electronic Devices
Riot	Gambling
Robbery	Other Violations/Technology Use
Sexual Offenses	Theft/No Force
Stalking	Trespassing
Threats/ Verbal/Physical	Vandalism
	Weapons

Appendix C—School Safety Construct

All items but one (*) were measured on a four point Likert scale with 1 = strongly disagree and 4 = strongly agree. Items in italics were reverse scored so that 1 indicated strongly agree and 4 indicated strongly disagree.

Scale	Subscale	Items	Reliability
Prevalence of Teasing and Bullying (PTB)	Perception of Teasing and Bullying (PTB_P)	How much do you agree or disagree with these statements? 1. I feel safe in school. These questions are about teasing and bullying you see at your school. Do not include friendly teasing that does not hurt anyone's feelings. 1. Students in this school are teased about their clothing or physical appearance. 2. Students in this school are teased or put down because of their race or ethnicity. 3. There is a lot of teasing about sexual topics at this school. 4. Bullying is a problem at this school. 5. Students in this school are teased or put down about their sexual orientation.	0.946

	Experience of Teasing and Bullying (PTB_E)	Use this definition of bullying to answer the questions below: Bullying is the repeated use of one's strength or popularity to injure, threaten, or embarrass another person on purpose. 1. I have been bullied at school in the past month. 2. I have been bullied at school this year (since school started last fall). 3. I have bullied others at school this year. 4. I have been physically bullied or threatened with physical bullying at school this year. 5. I have been verbally bullied at school this year. 6. I have been socially bullied at school this year. 7. I have been cyberbullied at school this year.	0.646
Gang Activity (GANG)	Gang Activity (Gang)	Now, we'd like to know about gangs at your school this year. You may know these as street gangs, fighting gangs, crews, or	0.924

		something else. Gangs may use common names, signs, symbols, or colors. For this survey we are interested in all gangs. 1. Are there gangs at your school this year? 2. Have gangs been involved in fights or other violence at your school this year? 3. Have gangs been involved in the sale of drugs at your school this year? 4. Have you considered joining a gang?	

*Value listed is the intraclass correlation (ICC) for the school means.

Appendix D—School Climate Construct

All items but one (*) were measured on a four point Likert scale with 1 = strongly disagree and 4 = strongly agree. Items in *italics* were reverse scored so that 1 indicated strongly agree and 4 indicated strongly disagree. The starred item was measured from 1 = "I do not expect to graduate from high school" to 6 = "I expect to complete postgraduate studies (such as a master's degree or doctoral degree) after graduating from a four-year college."

Scale	Subscale	Items	Reliability *

Student Engagement	Affective	How do you feel about going to this school? 1. I like this school. 2. I am proud to be a student at this school. 3. I feel like I belong at this school.	0.949
	Cognitive	How do you feel about going to this school? 1. I usually finish my homework. 2. I want to learn as much as I can at school. 3. Getting good grades is very important to me. 4. How far do you expect to go in school?*	0.817
Student Support	Respect for students	Most teachers and other adults at this school… 1. care about all students. 2. want all student to do well. 3. listen to what students have to say. 4. treat students with respect.	0.908
	Willingness to seek help	How much do you agree or disagree with these statements? 1. There are adults at this school I could talk to if I had a personal problem. 2. If I tell a teacher that someone is bullying me, the teacher will do something to help.	0.804

		3. I am comfortable asking my teachers for help with my homework. 4. There is at least on teacher or other adult at this school who really wants me to do well.	
School Disciplinary Structure	Academic expectations	How much do you agree or disagree with these statements? 1. My teachers expect me to work hard. 2. My teachers really want me to learn a lot. 3. My teachers expect a lot from students. *4. My teachers do not really care how much I learn.* 5. My teachers expect me to attend college.	0.856
	Disciplinary structure	Thinking about your school, would you agree or disagree with the statements below? Pick the answer that is closest to how you feel. 1. The school rules are fair. 2. The punishment for breaking school rules is the same for all students. 3. Students at this school are only punished when they deserve it. *4. Students are suspended without a good reason.* 5. When students are accused of doing something wrong, they get a chance to explain.	0.947

		6. Students are treated fairly regardless of their race or ethnicity. *7. The adults at this school are too strict.*	

*Value listed is the intraclass correlation (ICC) for the school means.

Appendix E--Notes on Multiple Imputation for Question 4A

The problem of inconsistent and incomplete students' attributes was addressed with two imputation techniques—a variant of mean imputation and multiple imputation. First, students in the DCV data who had inconsistent or incomplete attributes (i.e., gender, race/ethnicity, and/or IEP status) were identified and all offense records of these students were extracted. Then, for each student, the attributes were corrected by "majority rule"; that is, the student's attribute is replaced or imputed by the one that appears the most frequently in his/her records. In the case that the student attribute cannot be determined (i.e., in the case of even counts or all records missing), then multiple imputation based on the other consistent, complete attributes was used. The multiple imputation was conducted by SPSS Missing Values module, where the number of imputation was 5. A description of multiple imputation and its implementation in SPSS version 24 can be found at the following website, along with additional information about the types of analyses available after conducting multiple imputation:

https://www.ibm.com/support/knowledgecenter/en/SSLVMB_24.0.0/spss/mva/multiple_imputation_intro.html

Appendix F--Fit Statistics for Regressions in Question 4B

School level	Exclusionary discipline included	F (df_1, df_2)	*p*	R^2	F (df_1, df_2)	*p*	R^2
Elementary	All (1-180 days)	131.56 (15, 32018)	<.000	.058	82.23 (15, 32012)	<.000	.037
	Suspension (1-179 days)	114.16 (15, 32008)	<.000	.051	85.64 (15, 32004)	<.000	.039
	Short-term suspension (1-10 days)	158.73 (15, 31848)	<.000	.070	112.60 (15, 31817)	<.000	.050
Middle	All (1-180 days)	343.69 (15, 60145)	<.000	.079	383.54 (15, 57103)	<.000	.092
	Suspensio	282.48	<.000	.066	314.90	<.000	.077

	n (1-179 days)	(15, 60066)			(15, 57002)		
	Short-term suspension (1-10 days)	432.29 (15, 58796)	<.000	.099	397.54 (15, 55819)	<.000	.097
High	All (1-180 days)	597.63 (15, 65548)	<.000	.120	554.88 (15, 65348)	<.000	.113
	Suspension (1-179 days)	468.80 (15, 65283)	<.000	.097	446.71 (15, 65047)	<.000	.093
	Short-term suspension (1-10 days)	1345.27 (15, 63038)	<.000	.242	1101.88 (15, 63155)	<.000	.207
Combined	All (1-180 days)	26.89 (15, 3846)	<.000	.095	22.41 (15, 4255)	<.000	.073

	Suspension (1-179 days)	29.77 (15, 3832)	<.000	.104	22.36 (15, 4242)	<.000	.073
	Short-term suspension (1-10 days)	47.27 (15, 3712)	<.000	.160	44.23 (15, 4088)	<.000	.140

Appendix G—References

References

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