Counselors and Discipline:
The Effect on Exclusionary Practices in Secondary Education

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Abstract

Behavioral problems in schools present a significant challenge to create a conducive learning environment. To manage misbehavior, schools often rely on exclusionary disciplinary actions, such as suspensions and expulsions, which have well-documented negative impacts on students' long-term outcomes. In this paper, I study whether increasing the number of counselors per student reduces the use of these punitive measures in secondary schools. Using school-level administrative data from public schools in 27 U.S. states and leveraging exogenous variation driven by state-level student-to-counselor ratio mandates, I estimate the local average treatment effect of increased counselor availability on disciplinary outcomes. The results show that more counselors lead to significant reductions in suspensions, expulsions, and transfers for disciplinary reasons, though they do not impact school-related arrests. An additional counselor, on average, reduces by 26% the number of students who received an exclusionary disciplinary measure in high schools. This effect is particularly strong in schools with higher proportions of disadvantaged students and first-year teachers, suggesting that counselors support both vulnerable student populations and less-experienced teachers. Mechanism analysis indicates that counselors influence disciplinary outcomes mainly by altering how schools respond to misbehavior rather than directly reducing incidents of misconduct. Speculative analyses also suggest that differences in counselors' effectiveness can be explained by the overall number of administrative staff, which appears to complement their work by allowing counselors to focus on their core responsibilities.

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1 Introduction

Student behavior in schools has become one of the main challenges that teachers and principals face in creating an optimal learning environment (Irwin et al., 2022; Perera and Diliberti, 2023). Half of K-12 public school teachers rate student behavior at their schools as "fair" or "poor" (Lin et al., 2024), and identify it as one of their top concerns, second only to low pay.[1] The rise in disruptive behavior is particularly concerning, as it not only difficult teachers' jobs but also impedes peers' learning (Kristoffersen et al., 2015; Lazear, 2001).

A common response to disruptive behavior in U.S. public schools is the use of exclusionary disciplinary measures, such as suspensions and expulsions. Between 5 and 6 million students are suspended each year, accounting for more than 10% of public-school students. While these measures, when appropriately applied, may benefit non-disruptive peers (Hwang and Domina, 2021), they have detrimental short- and long-term effects on disciplined students (Lacoe and Steinberg, 2019; LiCalsi et al., 2021).

The main resources available in schools to support teachers in dealing with students' misbehavior are school-based mental health (SBMH) providers: nurses, psychologists, social workers, and counselors. Although most U.S. public schools do not meet the minimum recommended standards for the number of SBMH providers (Mann et al., 2019), school counselors are the most prevalent non-instructional professionals, with presence in almost 80% of public schools (U.S. Department of Education, Office for Civil Rights, 2023).

In this study, I estimate the causal effects of reducing the number of students per counselor on various disciplinary measures in secondary schools across more than half of the U.S. states. Using publicly available school-level data and an instrumental variables (IV) approach, I estimate the local average treatment effect (LATE) of the student-to-counselor

[1] National Education Association Survey 2022-2023.

ratio on the number of students suspended, expelled, transferred for disciplinary reasons, and with school-related arrests.

Identifying the causal impact of counselors on student discipline is challenging because the student-to-counselor ratio can be influenced by school observable and non-observable characteristics that are also correlated with disciplinary outcomes. For example, schools with more financial resources or with parents with a higher taste for education might have lower student-to-counselor ratios and fewer discipline issues, violating the exogeneity assumption.

To address this challenge, my identification strategy leverages state mandates and recommendations that set standards for the number of counselors per students in schools. Analogous to the class size caps case described by Angrist and Lavy (1999), these regulations induce exogenous variation in the student-to-counselor ratio by creating a nonlinear and non-monotonic relationship between schools' enrollment and the number of students per counselor.

The exogenous variation is driven by enrollment thresholds at which additional counselors must be hired, producing discontinuities and slope changes in the student-to-counselor ratio. I use this variation to implement an IV approach, where the predicted student-to-counselor ratio from state-specific mandates function instruments for the number of students per counselor in each school.

The identifying assumption is that, conditional on enrollment polynomials and covariates, the variation in the student-to-counselor ratio induced by these mandates is uncorrelated with unobserved determinants of disciplinary outcomes. The first stage shows a strong relationship between the mandate-based predicted ratio and the observed student-to-counselor ratio (Lee et al., 2022), confirming the instrument's relevance.

The results show that a lower student-to-counselor ratio in secondary public schools leads to fewer students receiving exclusionary disciplinary measures, suggesting that increasing the presence of counselors reduces the overall use of such actions. To ensure ro-

bustness, I restrict the analysis to schools near the enrollment thresholds where mandates on counselor ratios apply. The findings remain consistent across different definitions of proximity to these cutoffs, with similar size effects observed in both middle and high schools, though estimates are more precise for the latter.

Since disciplinary measures vary in severity and may have different consequences for students' academic trajectories and well-being, I also estimate the effect of the student-to-counselor ratio on each type of disciplinary measure. I find that a higher number of counselors in schools reduces the number of students suspended, expelled, and transferred to another educational institution for disciplinary reasons. In contrast, I do not find significant effects on the number of students with a school-related arrest.

There are two main channels through which counselors might reduce exclusionary disciplinary measures in secondary schools: by directly influencing student behavior or by altering how schools handle misbehavior to avoid exclusionary practices. To explore these mechanisms, I estimate the effect of the student-to-counselor ratio on reports of bullying or harassment, and on the number of offenses against students, teachers, and staff. The results show that counselors do not reduce the number of offenses in schools, but there is evidence of a decrease in reports of bullying and harassment among middle school students. Since the average number of students reporting harassment or bullying is low, these results suggest that the effect of counselors on reducing disciplinary measures is primarily through changes in how schools manage student discipline.

Students from lower socioeconomic backgrounds often face additional challenges, including higher rates of behavioral issues. In schools with a larger proportion of students from disadvantaged settings, the role of counselors may be even more significant. The results indicate that counselors are more effective in schools with a higher proportion of FRPL students, suggesting that their role is particularly important for students from disadvantaged backgrounds.

Additionally, first-year teachers may lack the experience to effectively manage class-

room behavior, leading them to rely more on exclusionary disciplinary actions. Thus, I examine whether the effectiveness of counselors is greater in schools with more first-year teachers. The findings suggest that counselors are indeed more effective in such settings, where their presence helps to mitigate the reliance on exclusionary disciplinary actions.

Counselors perform a variety of tasks in schools, such as conducting anti-bullying lessons and collaborating with families to address students' academic or behavioral challenges. This broad set of functions can lead to misconceptions about their role, and counselors may end up being assigned to numerous administrative duties (e.g., covering for absent teachers or maintaining student records). Therefore, having more school administrative staff could enhance counselors' efficacy by freeing them from tasks outside their primary role.

For this reason, I examine the heterogeneous treatment effects based on the number of administrative staff available in schools. Although this analysis is somewhat speculative, as the presence of administrative staff might be endogenous to the presence of counselors, the results suggest a complementary relationship between school counselors and administrative staff in reducing disciplinary actions in high schools.

These results are relevant because understanding the role of counselors in school discipline is particularly important considering recent trends. There has been a significant increase in student behavior issues following the return to in-person classes (Wang et al., 2021). Over 80% of public-school principals reported that the pandemic had a detrimental impact on students' behavior during the 2021–2022 academic year.[2] As a result, there is an increased need for effective approaches to discipline.

The way educational institutions discipline their students has significant implications. Exclusionary disciplinary measures can negatively affect students' academic outcomes, including achievement, enrollment, retention, and dropout rates (Arcia, 2006; Marchbanks III et al., 2015). Beyond academic consequences, these measures can also harm

[2]The National Center for Education Statistics' May 2022 School Pulse Panel survey of U.S. public K–12 schools. Retrieved from https://ies.ed.gov/schoolsurvey/

students during adolescence and into adulthood, increasing the likelihood of criminal victimization, involvement in criminal activities, arrests, and even incarceration (Bacher-Hicks et al., 2019; Wolf and Kupchik, 2017). In some cases, they may also push adolescents into the justice system (Fabelo et al., 2011; Nance, 2015).

Prior studies on the role of counselors in discipline outcomes have focused on lower grade levels, such as elementary schools. For instance, using within-school variation in counselor presence and data from a group of elementary schools in Alachua County, Florida, Carrell and Carrell (2006) and Carrell and Hoekstra (2014) find that a higher presence of counselors reduces students' disciplinary incidents. Similarly, Reback (2010) implements a regression discontinuity (RD) design based on Alabama's discrete enrollment cutoffs that determine funding for school counselors and finds that greater counselor subsidies reduce students' disciplinary incidents in elementary schools.

Conversely, the literature on counselors in high schools has mainly examined their impact on students' academic outcomes. Hurwitz and Howell (2014) use a quasi-experimental approach based on staffing mandates in 12 U.S. states and find that an additional high school counselor positively affects 4-year college enrollment. Castleman and Goodman (2018) estimate the effects of an intensive counseling program for low-income students in Massachusetts, showing that it shifted enrollment toward less expensive colleges with higher graduation rates and improved college completion. Mulhern (2020) uses quasi-random assignment in Massachusetts public high schools to estimate counselors' effects, finding positive impacts on high school graduation, college attendance, selectivity, and persistence.

This paper bridges a gap in the literature by using a quasi-experimental approach to study the impact of counselors on disciplinary outcomes in secondary education, an area that has not been previously examined. Prior literature has documented that exclusionary disciplinary measures have detrimental effects on secondary school students in the long run.

For example, according to Wolf and Kupchik (2017), suspended students have a 9 percentage point higher chance of being incarcerated than those who are not. According to LiCalsi et al. (2021), being suspended lowers the likelihood of graduating on time by 0.9 percentage points. Based on these findings, back-of-the-envelope calculations suggest substantial economic benefits from adding an additional counselor to a high school.

The estimated 26% reduction in suspensions would allow one more counselor to prevent three incarcerations per year, saving approximately $90,000 in public costs in incarceration-related expenses and $162,000 for individuals in lost wages prevention. Additionally, the improved graduation outcomes resulting from fewer suspensions may prevent around $33,500 in earnings losses. While speculative, these calculations offer an idea of the potential returns of investing in school counselors and the implications of reducing exclusionary disciplinary outcomes.

This paper also contributes to the long-standing discussion on the effectiveness of spending in education (Hanushek, 1996; Krueger, 1998). The findings show that non-instructional resources, such as counselors, have positive effects and complement both instructional resources, like first-year teachers, and other non-instructional resources, such as administrative staff.

Finally, this study contributes to the literature on school counselors' effectiveness by using data from middle and high public schools across 27 U.S. states. Unlike most prior research, which is limited to a few districts or states, this paper captures a broader range of variation in school characteristics and student demographics, including differences in staff composition and socioeconomic status. This wider scope allows a deeper understanding of how counselors impact different school contexts and student populations. Furthermore, by including schools from over half the U.S. states, this work also addresses concerns about external validity.

The rest of the paper proceeds as follows. Section 2 provides further background on the role of school counselors. Section 3 describes the data and presents descriptive statis-

tics. Section 4 explains the research design. Section 5 presents the results, and Section 6 concludes.

2 The Role of School Counselors

The role of school counselors in U.S. public schools has evolved significantly over the past decades. Initially focused primarily on academic guidance, their responsibilities have expanded to include social-emotional learning instruction for the entire student body (Gysbers, 2012). Today, school counselors have multifaceted roles, supporting students' academic, psychological, and social development (Heled and Davidovitch, 2020). In middle schools, they provide academic support and socioemotional counseling, while in high schools, they assist students in making career and educational plans.

According to the American School Counselor Association (ASCA), school counselors are trained to prevent and address student behavior problems across all grade levels. They collaborate with principals and administrative staff to develop and implement policies that promote appropriate behavior, creating a positive school climate conducive to learning and teaching. Although their role does not involve disciplining students, counselors often act as the first point of contact when students exhibit behavioral issues. When a teacher temporarily removes a student from the classroom, the counselor can step in to mediate and de-escalate the situation, helping to find solutions that avoid the need for more severe disciplinary measures. In this capacity, school counselors play a critical role in preventing the use of exclusionary practices, such as suspensions and expulsions.

School counselors provide both direct and indirect services. Direct services include classroom guidance, where counselors deliver lessons on social-emotional skills, academic strategies, and peer relations. These programs aim to improve academic achievement, prevent dropouts, and enhance discipline. Additionally, counselors can provide individual and group sessions to address students' specific issues, from academic prepa-

ration to mental health issues. Indirectly, they offer advice to parents and teachers, share techniques for handling disruptive students, and make referrals to mental health specialists when more extensive help is required.

Facilitating transitions between various educational stages is another important duty of school counselors. Counselors assist in preparing kids for the social and academic transitions that occur as they go from elementary to middle school or from middle school to high school. This entails planning orientation sessions, offering information on how to manage growing academic responsibilities, and assisting students in acquiring time management skills. They also help students choose their courses, making sure that their academic trajectories complement their long-term learning and professional objectives. For students who might require more support throughout these changes, counselors frequently work in conjunction with parents and educators to create customized strategies.

Additionally, school counselors are essential in crisis management. Counselors play a crucial role in giving students, staff, and even parents immediate emotional assistance during school-wide emergencies such as natural disasters, traumatic events, or violent incidents. They are trained to conduct crisis assessments, offer grief counseling, and coordinate with external agencies to provide ongoing mental health support. Counselors are frequently hired by schools to plan post-crisis rehabilitation programs, which may involve long-term mental health monitoring, group therapy, and courses on coping skills.

A big part of their job is to focus on mental health. School counselors use their training to support kids' socioemotional development and well-being. They are prepared to provide quick, problem-focused interventions and, if needed, assist with care coordination by connecting students with outside mental health specialists. However, fragmented service delivery, inadequate time allocation, and a lack of staff might hinder the effectiveness of these roles, indicating the need for improved integration and utilization of counselors' competencies inside schools (Zabek et al., 2023).

Additionally, school counselors play a crucial role in promoting diversity and inclu-

sivity in the classroom. To foster an inclusive environment where each student feels appreciated and understood, they actively support initiatives that foster respect for cultural, ethnic, and gender diversity. This can entail conducting anti-bullying workshops, planning cultural diversity celebrations, and offering assistance to students who might be dealing with identity-related concerns.

School counselors also contribute to a more conducive environment for learning for all students by reducing adverse peer effects when directly working with disruptive or low-achievement students and sharing techniques with teachers (Carrell and Hoekstra, 2014; Lavy et al., 2012). Considering that students' mental health, non-cognitive skills, and behavior are significant predictors of educational and labor outcomes, school counselors are a critical resource for supporting teenagers facing difficulties in their schools, a group that is dramatically increasing.

3 Data and Descriptive Statistics

3.1 Data

I use publicly available administrative data from the Civil Rights Data Collection (CRDC) of the Department of Education to estimate the causal effect of the student-to-counselor ratio on school discipline. The CRDC is a mandatory biennial survey of U.S. public schools that collects data on civil rights indicators related to access and barriers to educational opportunity from preschool through 12th grade. I complement this data with enrollment information from the Department of Education 2014-2015 school year Common Core Data.

To estimate the empirical model, I use information from the last two available rounds of the CRDC, corresponding to the 2015-2016 and 2017-2018 school years. The logic is that staffing choices in schools are usually made with anticipation of the current school year, and the counselors' hiring decisions are, in part, determined by schools' enrollment.

Consequently, in all my specifications, I use the 2014-2015 school year's enrollment levels and the 2015-2016 school year's number of counselors. Similarly, to avoid any possible post-treatment covariates problem, all the control variables in the reported specifications correspond to the 2015-2016 school year, while the outcome measures correspond to the 2017-2018 period. Thus, the estimated results represent the effects after two school years.

The main outcomes examined in this study are exclusionary disciplinary measures recorded in the CRDC administrative data. These measures include the number of students suspended, expelled, transferred for disciplinary reasons, and arrested for school-related offenses. The primary outcome of my analyses is the sum of these four variables, representing the total number of students who experienced these disciplinary actions. In this definition, a student is counted once for each type of disciplinary measure received but not multiple times within the same category.[3] Although the CRDC data includes other disciplinary measures, such as restraint, seclusion, and corporal punishment, these are not included in my analysis because they are banned in many states.

The original CRDC dataset contains virtually all the public schools in the country, with nearly 100,000 educational institutions of all grade levels. From this universe of public schools, I focus my analyses on all middle and high schools located in any of the 27 states that, at that point in time, had a mandate to provide counseling services in their schools (see the complete list in Table 1). Further, I restrict the analytical sample to schools with enrollment between 100 and 2,350 students (91% of selected schools) because, as explained in greater detail in section 4, it comprehends the set of institutions providing relevant variation in the data to identify the causal effect of the students-to-counselor ratio on discipline outcomes. Juvenile justice facilities, special education schools, and alternative schools were excluded as they may follow different counselors hiring decisions according to their students' needs.

[3]For example, if a student is suspended twice, they are counted only once under suspensions, but if the same student is both suspended and expelled, they are counted once in each respective category, resulting in a total count of two.

Finally, in all the analyses, I restrict the sample to schools with at least one counselor (more than 70% of public schools in the U.S. qualify). My primary variable of interest is the student-to-counselor ratio, which is undefined with a zero as the denominator. Consequently, the conclusions of my findings are relative to the intensive margin of school counselors' presence in schools.

The resulting analytical sample is a school-level cross-section dataset comprising roughly 11,000 middle and high public schools located in more than half of the U.S. states and that operated between the 2014-2015 and the 2017-2018 school years. The key information in this dataset is the schools' enrollment count, the full-time equivalent (FTE) counselors per school, and schools' student body composition (i.e., gender, ethnicity/race, FRPL, and limited English proficiency (LEP)). The data includes school expenditures and other FTE schools' staff like teachers, social workers, nurses, psychologists, and school resource officers. Finally, the school discipline outcomes are; the number of students with one or more in-school or out-of-school suspensions, the number of students expelled, the number of students transferred to other educational institutions for disciplinary reasons, and the number of students arrested. I exclude from my analyses the number of students subject to restraint or seclusion and those who receive physical punishment, as these measures are forbidden in many states.[4]

As the CRDC reports all schools' staff in FTE units, I created a variable that represents the presence of counselors in the schools, rounding the FTE counselor units to their upper integer as follows:

$$\text{Counselors} = \begin{cases} 0 & \text{if } \text{FTE} = 0 \\ 1 & \text{if } 0 < \text{FTE} \leq 1 \\ 2 & \text{if } 1 < \text{FTE} \leq 2 \\ \vdots & \end{cases}$$

[4]Corporal punishment in U.S. public schools is banned in 31 states and the District of Columbia, while over 30 states have laws that limit or regulate the use of physical restraint and seclusion in schools.

This variable better represents the state mandates and recommendations, as they do not refer to FTE but instead to an integer number of counselors per enrollment level. This is confirmed by estimating the first stage using the FTE counselors measure and the integer one, with a stronger relationship for the latter.

3.2 Descriptive Statistics

Panel (a) of Figure 1 shows the resulting distributions of high and middle schools by the number of counselors for the analytical sample. More than 90% of the schools have less than five counselors. Middle schools have a higher density of institutions with lower counts of counselors compared to high schools, which have a wider distribution, with institutions reaching larger numbers of counselors. Panel (b) in the same figure shows the distribution of high and middle schools by the number of students per counselor. As expected, with higher numbers of counselors among high schools, the ratio of students per counselor is lower compared to middle schools.

The descriptive statistics reported in Table 2 show that, on average, the number of counselors per school increases along with enrollment levels. Nevertheless, the number of students per counselor decreases as the number of counselors increases. On the other hand, the schools' proportions of underrepresented minority (URM) students and LEP students increase along with both the number of counselors and enrollment, while the opposite is true for the proportion of students qualified as FRPL, which is lower among larger schools and schools with more counselors.

According to the descriptive statistics presented in Table 3, as the number of counselors in schools increases, so does the number of students who receive various disciplinary actions. In middle schools, schools with two or more counselors have a much higher rate of suspended pupils than those with just one. In particular, schools with three or more counselors have almost twice as many suspended children as those with just one counselor. Although the increase is less noticeable, a similar trend is also seen for stu-

dents who are expelled and transferred for disciplinary reasons. Although they are less common, arrests also increase when middle schools have more counselors.

The pattern is significantly more noticeable in high schools. With more than twice as many suspensions as schools with a single counselor, schools with three or more counselors report a much higher average number of suspended students. Additionally, the data indicate that more counselors are associated with higher rates of student transfers, expulsions, and arrests, especially in high schools. However, the increase in transfers is less uniform among middle and high schools, even while the number of arrests and expulsions increases as the number of counselors rises.

As further explained in the next section, the identification strategy uses states' recommendations and mandates on the number of students per counselor in their public schools to estimate the LATE of the student-to-counselor ratio on school discipline outcomes. The resulting non-linear relationship between enrollment and the number of students per counselor allows the instrument to use both the discontinuities and the slope changes at each side of the corresponding cutoffs for identification. Consequently, in part of my analyses, I will also restrict the sample to schools with enrollment levels near the discontinuities. When I limit the analytical sample to schools with enrollment levels of 100 students above or below the corresponding cutoffs, the original number of observations in my analytical sample is reduced by 40%. The reduction is by 70% when I restrict the sample to schools with 50 students near the cutoffs.

4 Research Design

The student-to-counselor ratio varies substantially across U.S. public schools, a phenomenon also reflected in my analytical sample of middle and high schools (see panel (b) in Figure 1). These differences may, in part, be due to some school characteristics like the enrollment level, the availability of financial resources, students' socioeconomic back-

ground, and parents' preferences, all of which might directly or indirectly influence the number of counselors in educational institutions. At the same time, these characteristics are also likely to be associated with the students' behavior on campus and the institutions' ability to manage students' conflicts. Then, OLS estimates of the student-to-counselor ratio effect on school disciplinary measures, such as suspensions, expulsions, transferences to other institutions, and arrests, are likely to be biased. The problem is expected to persist even using a rich set of controls, as schools' non-observable characteristics (e.g., average parents' taste for education) associated with the student-to-counselor ratio and the outcomes of interest would violate the the exogeneity assumption.

As ASCA has recommended since 1965, each school in the U.S. should have 250 students per counselor (ASCA, 2012). While the national average of approximately 415 students per counselor[5] is still far from the proposed ideal, different states have progressively acknowledged the relevance of school counselors and other school-based mental health providers. Consequently, more than half of the country's states have introduced counseling services mandates for their public schools. Of these states, thirteen have specific student-to-counselor ratios that should be met, while other three, Iowa, Indiana, and Tennessee, have specific ratio recommendations (Table 1 shows the full list and details).

Analogous to Maimonides' rule for the Israel class size case (Angrist and Lavy, 1999; Angrist et al., 2019) and to class size rules for other countries (Angrist et al., 2017; Ballatore et al., 2018; Bingley et al., 2005; Bonesrønning, 2003; Browning and Heinesen, 2007; Dobbelsteen et al., 2002; Gary-Bobo and Mahjoub, 2013; Hoxby, 2000; Leuven et al., 2008; Piketty, 2004; Urquiola, 2006; Urquiola and Verhoogen, 2009; Woessmann, 2005), these states' mandates and recommendations of student-to-counselor ratios produce nonlinear and non-monotonic relationships between the schools' enrollment and the number of students per counselor. More specifically, an additional counselor should be hired whenever

[5]Source: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Public Elementary/Secondary Education Survey," 2020-21 v.1a. https://nces.ed.gov/CCD/ELSI/

an increase in school enrollment level results in a student-to-counselor ratio exceeding the maximum allowed by the rule. Therefore, the average number of students per counselor discontinuously decreases with total enrollment. Hence, the student-to-counselor ratio recommendations and mandates represent a potentially exogenous source of variation in the number of students per counselor that can be used to estimate its LATE on school discipline outcomes.

To illustrate how the states' student-to-counselor ratio rules induce an exogenous variation in the number of students per counselor in schools, assume a specific educational institution that strictly follows its hypothetical state recommendation of one counselor for every 250 students. In this case, the student-to-counselor ratio increases one by one with the enrollment count until it reaches 250 students. When an additional student enrolls in that school, a second counselor is hired, implying that now there are 251 students for 2 counselors, sharply decreasing the ratio to half, 125.5 students per counselor. Similarly, when the enrollment level grows to 500 students, the student-to-counselor ratio reaches 250 again, but with 501 students enrolled, a third counselor is hired, and the average number of students per counselor drastically drops to 167, and so forth. Consequently, in this case, discontinuities of the student-to-counselor ratio arise at each enrollment level multiple of 250. Also, considering that each consecutive discontinuity through enrollment is smaller than the previous one, the slope of the relationship between the number of students per counselor and enrollment should also change, becoming flatter at the right of each cutoff. The student-to-counselor ratio's discontinuous variation, as well as the change in slope that is produced when enrollment crosses cutoffs, are both exploited by the parametric identification strategy described below.

In practice, for the 2017-2018 school year, there were 29 states with mandates to offer counseling services in their schools (not necessarily asking for a specific ratio). Eleven of those states do not mandate or recommend a specific student-to-counselor ratio to follow. On the other hand, 13 other states have a mandate defining a specific number of

students per counselor. Similarly, another three states only recommend (not mandate) a determined number of students per counselor in their schools, and the conclusions and results do not significantly change when excluding this group of states (IA, IN, and TN). Finally, three states (DC, MS, and WA) were discarded from the analysis because, despite having mandates to offer counseling services, they do not induce a discontinuity in the number of students per counselor at specific enrollment cutoffs. Regardless of whether the educational institutions in these three states follow their rules, they do not add variation for identification, as the mandate only asks for having at least one counselor in the school, no matter their enrollment level.

The following function summarizes the state-specific rules:

$$f_{sj} = \frac{e_{sj}}{int\left[\left(\left(e_{sj} - 1\right) r_j\right) + 1\right]}\,, \tag{1}$$

where e_{sj} is the total enrollment count of school s in state j, and r_j represents the number of students per counselor mandated or recommended by state j (e.g., 250, 300, 350). A slightly different version of this function describes the ratio mandates for two states (AL and NE) for which the number of students per counselor (r_j), and therefore the discontinuities, are not constant throughout enrollment levels (see details in Table 1). Also, for the schools located in the eleven states that have mandates of offering counseling services but without specific ratios to follow, I assigned the ratio recommended by the ASCA (i.e., $r_j = 250$).

It is important to note that schools with a recommended number of students per counselor, even in states with specific ratio mandates, do not necessarily follow their state-specific rules. One of the reasons is that counselors represent a financial cost for schools. Thus, as mentioned before, these student-to-counselor ratio recommendations and mandates are not the only source of variation in U.S. public middle and high schools. Figure 2 shows the number of students per counselor for different enrollment levels and the cor-

responding function, grouped by mandated or recommended common ratios. Overall, the observed school student-to-counselor ratio is higher than what is predicted by the mandate or recommendation function. Despite this difference in levels, the student-to-counselor ratio follows a close pattern of sharp declines near enrollments multiple of r_j for each case. Notably, even for the first group, the schools in states without a specific recommended or mandated ratio, for which I use the 1:250 ASCA's recommendation, the discontinuities at the corresponding multiples of 250 can be clearly observed. It is important to note that, instead of what would be expected if the rule were strictly followed, some schools hire an additional counselor somewhat after reaching the corresponding maximum number of students per counselor determined by f_{sj}. Therefore, in some cases, the number of students per counselor seems to decline at enrollment values shortly after the corresponding cutoff. To focus on the useful variation for identification, which comes from the non-linearities generated by f_{sj}, I restrict my analytical sample to schools with enrollment levels between 100 and 2,350 students. This interval contains the lower of all the cutoffs ($r_j = 250$) and excludes the higher cutoffs as there are very few large schools near those points.

Using the variation at the cutoffs, the student-to-counselor ratio effects could be estimated with a nonparametric fuzzy RD design (Hahn et al., 2001). Nevertheless, as argued by Browning and Heinesen (2007), I employ a parametric approach as comparing schools only at the threshold would mean using very few observations. Also, in my setting, I have multiple discontinuity points at different enrollment levels, which vary by each rule (i.e., r_j). Further, treatment assignment cannot be adequately defined by a single dichotomous variable, and the observed nonlinearities are not particularly pronounced at unique points but within narrow intervals around them.

Therefore, following Angrist et al. (2017) and most of the other studies using Maimonides's style rules to estimate class size effects, I implement a parametric model that takes advantage of the discontinuities and variations in the slope of the association be-

tween enrollment and the number of students per counselor resulting from fluctuations in enrollment. Appendix Figure A.1 serves to illustrate these changes in level and slope. The figure shows both a decrease in levels of the student-per-counselor ratio at the right of the centered enrollment level and a flattened slope. The main idea is that incorporating elements of RD and regression kink designs (Card et al., 2015) increases the parametric method's statistical power.

Specifically, I use the recommended/mandated number of students per counselor function to obtain IV estimates of student-to-counselor ratio effects on school discipline. It is worth noting that the function f_{sj} and the corresponding instrumented student-to-counselor ratio are dependent on the schools' enrollment level, but they are nonlinear and nonmonotonic. Therefore, I can control for a set of continuous enrollment effects when using f_{sj} as an instrument to effectively partial out any association between the outcome of interest and the number of students per counselor from enrollment. In other words, I exploit the fact that the student-to-counselor ratio is determined, to some degree, by a known discontinuous function of the number of students enrolled in the school. Then, to identify the student-to-counselor ratio's causal effect, the IV estimates use the function defined in (1) to capture the previously described discontinuities and changes in slope between schools' enrollment and the student-to-counselor ratio. Meanwhile, a polynomial of the enrollment variable included in the specification captures all other associations between the enrollment level and the outcome of interest, so the IV consistently estimates the LATE. The first and second stage equations, estimated by 2SLS, are respectively defined as:

$$SCR_{sj} = \alpha_0 + \alpha_1 f_{sj} + g(e_{sj}) + \mathbf{X}'_{sj}\boldsymbol{\alpha}_2 + \epsilon_{sj}\,, \tag{2}$$

$$y_{sj} = \beta_0 + \beta_1 \widehat{SCR}_{sj} + h(e_{sj}) + \mathbf{X}'_{sj}\boldsymbol{\beta}_2 + \varepsilon_{sj}\,, \tag{3}$$

where y_{sj} is the outcome of interest (i.e., school disciplinary measures) for school s in state j, SCR_{sj} is the corresponding observed student-to-counselor ratio, f_{sj} is the number of students per counselor predicted by the mandate/recommendation function defined in (1). The vector $\mathbf{X}_{sj}$ includes an indicator for schools in states with specific ratio mandates, an indicator for schools in states with specific ratio recommendations, and school characteristics such as an indicator for charter schools and variables for student body composition. Enrollment second-order polynomials are represented by $g(e_{sj})$ and $h(e_{sj})$, and ε_{sj} and μ_{sj} are idiosyncratic error terms. The parameter of interest is β_1, which captures the LATE and is interpreted as the average change in the outcome y_{sj} caused by an additional student per counselor in the school (for compliers). The first stage residual, ϵ_{sj}, captures other elements besides f_{sj}, $g(e_{sj})$, and $\mathbf{X}_{sj}$, that correlate with SCR_{sj}. These elements are also likely to be associated with the outcomes of interest, y_{sj} (school discipline), so as mentioned before, OLS estimates of (3) should not be interpreted as causal.

As defined in (1), the mandate/recommendation function, f_{sj}, depends on enrollment e_{sj}. At the same time, enrollment can be associated with the outcome through different channels than the number of students per counselor. Therefore, the main identification assumption, in this case, is that all the other ways in which e_{sj} affects the outcome of interest are disentangled from the instruments in (2) and effectively controlled by the covariates included in (3). So, all non-student-to-counselor effects on y_{sj} depend on enrollment exclusively by $h(e_{sj})$ and the included covariates in the estimated specification. In other words, the outcome is only correlated with f_{sj} by the association of the latter with the number of students per counselor after controlling for $\mathbf{X}_{sj}$ and polynomials of enrollment. In this manner, including smooth enrollment functions as covariates and focusing on estimates that restrict the sample to variations near the cutoff points help guarantee that β_1 is identified by the instrument's nonlinearities and changes in slope (Angrist et al., 2017), preventing the instrument from capturing any effects of enrollment. For this reason, my main specifications consider schools that are in the range of 100 and 50 students

above or below each discontinuity point (i.e., multiples of the corresponding r_j).

There are several reasons why enrollment levels might be associated with the outcomes of interest. For instance, wealthier districts might be able to have a higher number of school institutions or campuses, with a lower average number of students as a result. The opposite can be true if more populated areas are, on average, also wealthier. Additionally, more educated parents may decide to live in districts with smaller schools so that their children receive more attention from school staff. Although there may be more reasons than those mentioned, it is hard to find any justification for why these effects could have sharp discontinuities at enrollments multiple of r_j, as the ones on the number of students per counselor induced by the different rules in each case.

To check how reasonable this assumption is, I examine the number of counselors and other school characteristics' continuity at multiples of r_j of the schools' enrollment distribution for each case. Appendix Figure A.2 shows, grouped by mandated or recommended common ratios, a "stairway" looking relationship between the number of counselors and enrollment levels, with jumps near multiples of r_j. On the other hand, similar plots are presented in Appendix Figures A.3 to A.6, but for other four types of school staff. Figure A.3 shows a linear relationship between the number of teachers in schools and the enrollment level for schools grouped by r_j. Similarly, Figures A.4, A.5, and A.6 show how the number of psychologists, social workers, and nurses vary with the number of students per school, showing that most institutions have none or 1 of these workers independently of the enrollment level. None of these four figures show a "stairway" pattern with breaks at multiples of r_j as the one observed for counselors.

Additionally, the relationship between four different variables describing the schools' student body composition and the number of students centered at the corresponding discontinuities[6] are shown in Figure A.7. The proportion of FRPL, the proportion of female, URM, and LEP students have a weak association with enrollment and do not show a dis-

[6]Each school is centered with respect to the closest corresponding threshold discontinuity determined by r_j.

continuity at each side of the centered threshold. Despite this being a necessary but insufficient condition, as is also needed balance of unobserved characteristics, these graphical results (reinforced by the analog regression estimates in Appendix Tables A.1 and A.2) represent supporting evidence for the plausibility of the continuity assumption in the analytical sample. It seems difficult to think about unobservables affecting the outcome that, at the same time, are uncorrelated to observables and also influence the result variable.

A second potential threat for identification in this setting would be parents selectively taking advantage of the student-to-counselor rules to register their children in schools with a lower number of students per counselor. This situation would happen if, for example, parents manage to enroll their children in schools with student counts just above a multiple of r_j. The violation of this assumption would conduce to bias in my estimates, as the student-to-counselor ratio would be correlated with the outcome through a different channel, captured by f_{sj} and consequently not satisfying the instrument's exogeneity (i.e., exclusion restriction). Nevertheless, this situation seems unrealistic as there is no way to prevent enrollment levels from varying from the predicted ones and ending up in a school with a couple of students just below the threshold, avoiding the need for an additional counselor and thus facing a higher student-to-counselor ratio. Moreover, it is important to consider that transferring from one public school to another might not be easy in the U.S. without physically reallocating, and it is unclear whether private schools hire more counselors than public ones.

To verify the validity of this assumption, I run manipulation tests for the running variable (McCrary, 2008) using a local polynomial density estimation (Cattaneo et al., 2020; Cattaneo et al., 2021). In the presence of manipulation, a higher density of schools just at the right of enrollment cutoffs should be observed, reflecting the non-random sorting of parents into schools that are just about to reach the specific enrollment level. Appendix Figure A.8 shows that there is no significant accumulation of schools just above enrollment levels multiple of r_j, which is supporting evidence of no manipulation.

A second assumption needed is the relevance of the instrument, and it can be empirically tested. As further explained in the Results section below, the first-stage estimates show a strong association between the instruments and the endogenous variable, dissipating concerns about a weak instrument.

The last assumption in this context is monotonicity. This implies that schools with a total number of students at the right of the cut-off points do not reduce the number of counselors hired but instead increase them. In other words, there are no defiers. The patterns observed in Figure 2 provide evidence of the absence of defiers since the number of students per counselor falls instead of drastic increases to the right of the discontinuity points.

Regarding representativeness of the IV estimates, it is important to recall that 2SLS put higher weights on schools where the instruments have more significant effects on the number of students per counselor. As mentioned, the first discontinuities of the rules are larger than the subsequent ones. Therefore, smaller schools are primarily responsible for the estimated results. Further, the estimated effects are also local to schools that comply with the corresponding rule, or in other words, that get an additional counselor when their enrollment crosses a cutoff. If, for example, these schools are also those where the return of adding a counselor is more significant, the estimated LATE would be greater than the average treatment effect (ATE) obtained if the treatment were randomized across all institutions. Finally, the estimated causal effects in this context should be interpreted as policy effects as opposed to technology effects, in that they may include potential parental reactions (complementary or substitute) to student-to-counselor variation (Todd and Wolpin, 2003).

Since students from disadvantaged backgrounds are more likely to receive disciplinary measures, I estimate heterogeneous treatment effects based on the percentage of FRPL students in schools. I also examine heterogeneous treatment effects by the percentage of first-year teachers, as less experienced instructors tend to rely more on exclusionary

disciplinary measures. Finally, due to the wide range of tasks assigned to counselors in schools, they are often given administrative duties unrelated to their core responsibilities. Therefore, I also estimate heterogeneous treatment effects by the number of administrative staff, as they may relieve counselors from tasks outside their primary duties.

The heterogeneity analysis first-stages (Equations 4 and 5) and the second-stage specification (Equation 6) are as follows:

$$SCR_{sj} = \gamma_0 + \gamma_1 f_{sj} + \gamma_2 f_{sj} \times H_{sj} + \gamma_3 H_{sj} + p(e_{sj}) + \mathbf{X}'_{sj}\boldsymbol{\gamma}_4 + \mu_{sj}\,, \tag{4}$$

$$SCR_{sj} \times H_{sj} = \delta_0 + \delta_1 f_{sj} + \delta_2 f_{sj} \times H_{sj} + \delta_3 H_{sj} + m(e_{sj}) + \mathbf{X}'_{sj}\boldsymbol{\delta}_4 + \nu_{sj}\,, \tag{5}$$

$$y_{sj} = \lambda_0 + \lambda_1 \widehat{SCR}_{sj} + \lambda_2 \widehat{SCR_{sj} \times H_{sj}} + \lambda_3 H_{sj} + q(e_{sj}) + \mathbf{X}'_{sj}\boldsymbol{\lambda}_4 + \omega_{sj}\,, \tag{6}$$

where H_{sj} represents the heterogeneity variable.

Public school funding varies significantly by district, with disparities as high as 35% between the lowest and highest-funded schools within states like Nevada. Districts are also primarily responsible for enforcing accountability and ensuring the implementation of state-level mandates, such as student-to-counselor ratio requirements. Furthermore, schools within the same district often share resources, such as staff members who work across multiple schools. For these reasons, errors are likely to be correlated within districts, and therefore, in all my estimates, standard errors are clustered at the school district level.

5 Results

5.1 Main Results

The IV-estimation first-stage results for middle and high schools are shown in Table 4. I do not report covariates, except for the second-order enrollment polynomial, as the

student-to-counselor function is a transformation of the total number of students in the school. Considering the observed discontinuities of the number of students per counselor in Figure 2, the student-to-counselor recommendation/mandate function (f_{sj}) is, as expected, positive and statistically significant for middle and high schools. The predicted number of students per counselor increases the observed student-to-counselor ratio. Also, its coefficient is larger in magnitude for high schools than for middle schools (0.5 and 0.3, respectively) and nearly unchanged when covariates are added to the model. After the inclusion of enrollment's second-order polynomial in the specification, the coefficient on f_{sj} decreases because, as previously explained in the identification strategy section, the polynomial helps purge the instrument from enrollment (and other correlated) effects intrinsically embedded in it by definition. Importantly, while the first-stage F-statistic is larger for high schools than for middle schools, it is large enough to rule out the presence of a weak instrument problem (Lee et al., 2022).

The IV-estimation second-stage results for the number of students who received an exclusionary disciplinary measure are presented in Table 5, separately for middle and high schools. In both cases, the first columns present naive OLS estimates for comparison purposes. The rest of the columns show the IV/2SLS estimates, first using the full analytical sample and then restricting it to schools close, in enrollment level, to the corresponding f_{sj} discontinuities. Thus, columns (3) and (7) include schools with enrollment counts falling within 100 students below or above each cutoff. Similarly, columns (4) and (8) restrict the sample to schools with 50 students below or above the corresponding predicted discontinuities. Intuitively, as mentioned in section 4, the corresponding discontinuities and changes in slope allow to partial out the student-to-counselor effect from the enrollment and its other correlated effects.

The naive OLS estimates of the student-to-counselor ratio on school discipline outcomes show very small associations, with coefficients close to zero, for the student per counselor and the number of students that received any of the four considered types of

exclusionary disciplinary measures. These results could be interpreted as counselors being ineffective in influencing school discipline measures, but these estimates are likely biased. One of the probable reasons is that, in my sample, the school enrollment level and the proportion of FRPL students are negatively correlated. Thus, the number of students per counselor (positively associated with enrollment) is also indirectly capturing part of the socioeconomic composition effects (or other unobservables correlated with socioeconomic status), underestimating the counselors' impact on discipline outcomes.

On the other hand, the IV second-stage results show larger effects for both middle and high schools, indicating that a reduction of one student per counselor decreases the average number of students receiving an exclusionary disciplinary measure by between 0.5 and 0.6. When restricting the sample to schools with enrollment levels near the corresponding discontinuities, the results are statistically significant only for high schools. The estimated coefficients remain consistent when restricting to schools with enrollments within 50 or 100 students of the corresponding cutoffs.[7]

To put this result in perspective, I consider the decrease in the student-to-counselor ratio that would occur if an average school hired an additional counselor. For the average high school in my sample, an additional counselor would reduce the student-to-counselor ratio by 73 students per counselor. Consequently, hiring an additional counselor in the average high school would decrease the number of students receiving exclusionary disciplinary measures by 39. This result indicates that, on average, an additional high school counselor reduces the percentage of students receiving an exclusionary disciplinary measure by 26%.

Using findings from the literature estimating the effects of suspensions on future outcomes, I conducted back-of-the-envelope calculations to estimate the economic benefits of an additional counselor in the average high school in my sample. According to LiCalsi et al. (2021), suspensions lower the probability of graduating on time by 0.9 percentage

[7]The results do not vary even when reducing to $-/+30$ students around the corresponding cutoffs, but the sample decreases substantially and with it the statistical power.

points, while Wolf and Kupchik (2017) estimate that suspensions raise the likelihood of incarceration by 8.9 percentage points.

An extra counselor might cut suspensions by 26%, or about 33 fewer suspensions yearly, considering the average high school with 128 suspended students annually. This means avoiding three incarcerations every year, saving around $90,000 in public expenses, assuming a one-year incarceration costs approximately $30,000 (Mai and Subramanian, 2017), and preventing approximately $162,000 in missed wages, based on median annual earnings of approximately $54,000 (Guzman and Kollar, 2024). Together, it adds up to $252,000 in savings from reduced incarceration alone.

Additionally, the 33 fewer suspensions translate into 0.3 more students graduating on time each year. Of these, 20% are projected to never graduate, losing $400,000 over their career, and 80% are supposed to graduate later with a lifetime earnings penalty of $40,000.[8] Better graduation results translate into savings of about $33,500. When the savings from graduation and incarceration are combined, the estimated annual economic benefit of hiring an extra counselor in the average high school is approximately $285,500.

While speculative and relying on simplifying assumptions, these calculations highlight the significant potential economic returns from reducing exclusionary discipline practices through investments in school counseling staff.

Since exclusionary disciplinary measures vary in severity and may have different consequences for students' academic trajectories and well-being, I estimate the model separately for each of the most frequently used disciplinary measures.

Regarding the number of students with in- and out-of-school suspensions, the results in Table 6 show statistically significant effects for high schools. The estimated effects are somewhat larger in magnitude when I restrict the sample to schools within the $(-/+50)$

[8]The lifetime earnings difference of $400,000 between high school graduates and non-graduates is based on the U.S. Bureau of Labor Statistics (2023) data, which indicates that high school graduates earn approximately $10,000 more annually than non-graduates. Over a 40-year working career, this amounts to $400,000 in additional lifetime earnings. The $40,000 penalty for delayed graduation assumes that delayed high school graduates experience a 10% reduction in lifetime earnings relative to on-time graduates (Murnane et al., 2000).

discontinuities. Specifically, reducing the student-to-counselor ratio by one student per counselor decreases the number of students suspended by approximately 0.42 on average. For the average high school in my sample, hiring an additional counselor would reduce the ratio by 78 students per counselor. Thus, hiring an additional counselor in a typical high school would decrease the number of students suspended by 36, corresponding to an approximate 27% reduction.

The student-to-counselor ratio also affects the number of students transferred to other institutions for disciplinary reasons. More specifically, Table 7 shows that decreasing the number of students per counselor by one unit reduces the number of students transferred for disciplinary reasons to a different educational institution by approximately 0.038 in middle schools and 0.066 in high schools. These results are statistically significant at a 10% for middle schools and a 1% for high schools with $-/+100$ students around the cutoffs. For the typical high school in my sample, it would take a reduction of approximately 35 students per counselor to reduce to zero the number of students transferred for disciplinary reasons to another educational institution. In other words, would be required to hire about half of an additional (FTE) counselor.

On the other hand, as shown in Table 8, a reduction in the number of students per counselor also decreases the number of students expelled from schools. A one-student decrease in the student-to-counselor ratio reduces the number of students expelled by approximately 0.06 in middle schools and 0.04 in high schools.

These results are not statistically significant for middle schools when I restrict the sample to schools with $-/+100$ students around the cutoffs, whereas they are significant at the 1% level for high schools. It is noteworthy that the average number of students expelled in my analytical sample is nearly twice as high as the number of students transferred for disciplinary reasons in both types of institutions. This difference is expected, as expulsions may occur not only for disciplinary reasons but also for other causes, such as truancy. Additionally, the estimated effects on expulsions are slightly smaller in magni-

tude than those on transfers, suggesting that a greater effort would be required to reduce expulsions to zero compared to transfers. Specifically, the average high school would need to reduce the student-to-counselor ratio by around 100 students, which would require hiring approximately four-fifths of an additional counselor.

The fourth school disciplinary outcome considered in this study is the number of students who received a school-related arrest. The results in Table 9 show that the estimated coefficients are small and not statistically significant across specifications for both middle and high schools. This null result remains consistent when restricting the sample to schools with enrollments near the cutoffs.

Overall, a reduction in the number of students per counselor reduces at least three measures of school discipline; suspensions, transfers for disciplinary reasons, and the number of students expelled from school. Although there are no significant effects on the number of students arrested, this is a result that might be challenging for school counselors to affect, and it might even be out of their scope. If the incident involved is of great danger to the school community, there might be few possible alternatives besides law enforcement involvement.

Tables A.3 and A.4 show results from reduced form estimates for middle and high schools, respectively, including schools with $-/+100$ students around the corresponding cutoffs. The reduced form estimates reinforce the IV findings, showing a continuous pattern of positive and statistically significant results between the student-to-counselor recommendation/mandate function f_{sj} and various disciplinary outcomes for both middle and high schools. Specifically, a one-unit increase in f_{sj}—indicating fewer counselors available per student—is associated with an additional 0.058 students receiving disciplinary measures in middle schools and an even larger effect of 0.179 in high schools, significant at the 5% and 1% levels, respectively. The stronger magnitude of the coefficients in high schools compared to middle schools aligns with the second-stage IV results, suggesting that the scarcity of counseling resources has a particularly pronounced impact on

disciplinary practices in high schools.

Higher student-to-counselor ratios are associated with a higher chance of transfers and expulsions, emphasizing counselors' role in reducing exclusionary disciplinary measures. The coefficients for transfers and expulsions are larger for high schools (0.020 and 0.016) than for middle schools (0.07 and 0.07), and statistically significant in both cases. It's interesting to note that, although suspensions in high schools have a statistically significant correlation with f_{sj} (0.141, significant at 1%), the effect is not significant in middle schools, suggesting that these institutions may use suspensions differently than transfers or expulsions as disciplinary measures. In line with the IV findings, the null effect of f_{sj} on school-related arrests at both levels reinforces the possibility that counselors may not be able to stop more serious occurrences that call for the involvement of law enforcement. All things considered, these findings lend credence to the idea that counselor availability affects a variety of disciplinary measures, especially those that involve removing students from their educational setting, in addition to suspensions.

It is also worth noting that, in general, counselor effects on school discipline outcomes are larger in high schools relative to middle schools. While these results might reflect a higher efficacy of high school counselors over their counterparts in middle schools, it seems that the context and the likely different types and frequency of the problematic incidents might be a plausible explanation for the fact that high school counselors' effects on school discipline are larger than in middle schools. The average outcome variable for each case is shown below the estimated coefficients in all panels of Tables 6 to 9. It is no coincidence that the average value of the dependent variable in all cases in middle schools is much lower than the average value observed in high schools. Hence, there is "more room" to impact these school discipline measures in high schools than in middle schools.

Additionally, the IV estimated effects on school discipline are quite robust. The magnitude and significance level of the estimated coefficients for the student-to-counselor ratio

on the first three school discipline outcomes do not vary substantially with the inclusion of covariates after incorporating the enrollment's second-order polynomial in my specifications. Moreover, when I restrict the estimation sample to the schools with enrollment levels of 100 or 50 students above and below the discontinuity cutoffs, where intuitively, the identification strategy should be even stronger, the results show little variation.

5.2 Mechanisms

School counselors can reduce the use of exclusionary disciplinary measures in two ways. First, they can directly influence student conduct, reducing misbehavior and thus the need for exclusionary disciplinary actions. Second, they can help change the school's approach to handling misbehavior by replacing exclusionary discipline with alternative methods.

To understand the mechanisms through which counselors decrease the use of exclusionary disciplinary measures, I estimate the impact of the student-to-counselor ratio on two students' behavior outcomes: the number of students who report being harassed or bullied, and the number of offenses involving students, faculty, or staff. A positive effect of the student-to-counselor ratio (i.e., a negative impact of a larger counselors' presence) on the number of students being harassed or bullied, and on the number of offenses to students, teachers, or school staff, would suggest that counselors reduce the use of exclusionary disciplinary measures mostly by affecting students' conduct.

The results for harassment and bullying are presented in Table 10. For middle schools, the naive OLS estimates show a statistically significant but negative association between the student-to-counselor ratio and the reported cases of harassment or bullying, suggesting that a higher presence of counselors is associated with an increase in reports of these incidents. The sign of the estimated coefficients switches for the IV estimates, suggesting a reduction in harassment and bullying when counselors presence increase. Specifically, a decrease in the student-to-counselor ratio by one student is associated with a 0.015 reduc-

tion in reports of harassment or bullying when including the full sample. When restricting the sample to schools with enrollment levels within $-/+100$ or $-/+50$ students around the mandate discontinuities, the coefficients increase (0.065 and 0.074, respectively) but lose statistical significance, with only the ±100 estimate remaining significant at the 10% level.

However, there is no statistically significant effect of the student-to-counselor ratio and reported instances of bullying or harassment in high schools. Although the IV second-stage estimates are marginally positive (0.005 and 0.007 for the $-/+100$ and $-/+50$ student thresholds, respectively), they are still statistically insignificant. This null result for high schools suggest that counselors have a less significant impact on the prevalence of harassment or bullying at this educational level.

I also estimate the effect of students per counselor on the number of offenses against students, educators, or staff in schools, as shown in Table 11. The IV estimates coefficients for middle schools are negative, but not statistically significant, for all specifications. With coefficients near 0 in every subsample, the IV estimates for high schools also reveal no discernible impacts of counselors on school offenses.

Overall, the findings show that counselors do not impact the prevalence of bullying and harassment or offenses in schools. The estimates indicate that the student-to-counselor ratio has no significant effect on the frequency of these incidents in middle or high schools. Although I find that counselors have a significant impact on lowering bullying and harassment in middle schools, the average number of these events is low, thus it is unlikely that this decrease is what causes the decline in exclusionary disciplinary measures.

Instead, the results support the idea that counselors help change the way schools handle misbehavior. Counselors seem to have an impact on the selection of disciplinary measures, substituting less harsh alternatives for exclusionary measures like suspensions, expulsions, and transfers, rather than decreasing the incidence of disciplinary episodes.

These results highlight the role of counselors in fostering a more supportive school climate that emphasizes non-exclusionary responses to student misconduct.

5.3 Heterogeineity Effects

5.3.1 Proportion of FRPL Students

I then examine how the student-to-counselor ratio affects disciplinary measures based on the percentage of students who qualify for FRPL. The presence of counselors may have a greater impact in schools with students from disadvantaged backgrounds, as students from low-income households are more likely to face disciplinary actions.

I estimate a heterogeneous treatment effect model by adding an interaction between my instrument (f_{sj}) and the proportion of FRPL students in the school to the IV specification, instrumenting for the number of students per counselor interacted with the heterogeneity variable. A positive and statistically significant interaction coefficient would indicate that increasing the student-to-counselor ratio (when interacted with the proportion of FRPL students) leads to higher disciplinary actions, and vice versa, suggesting that counselors have a greater marginal effect in schools with a higher percentage of low-income students.

Table 12 presents second-stage IV estimates for various disciplinary outcomes: the number of students with disciplinary measures (Panel A), suspensions (Panel B), transfers for disciplinary reasons (Panel C), and expulsions (Panel D). The interaction coefficient is positive and statistically significant across all disciplinary measures for both middle and high schools. This finding suggests that counselors are more effective at reducing disciplinary actions in schools with higher proportions of FRPL students. However, the main effect of counselors appears to be negative for most disciplinary outcomes, indicating that an increased presence of counselors might actually raise the number of exclusionary disciplinary measures in schools with very low proportions of FRPL students.

Figure 3 shows the marginal effect of the student-to-counselor ratio and the distribution of high schools by the percentage of FRPL students. The student-to-counselor ratio has a negative effect on the number of students with exclusionary disciplinary measures in high schools with less than 25% FRPL students. Importantly, the distribution of high schools shows that a small proportion of schools have less than 20% FRPL students, and these negative effects are not statistically significantly different from zero. When the percentage of FRPL students exceeds 30%, the marginal effect of counselors becomes positive and statistically significant, increasing continuously as the percentage rises.

These findings highlight the value of counselors in low-income schools, where they appear to be an effective way to reduce exclusionary disciplinary measures. The results also suggest the potential benefits of assigning counselors to schools that serve economically disadvantaged populations.

5.3.2 Proportion of 1st-Year Teachers

I also examine the differentiated impact of the student-to-counselor ratio on disciplinary measures based on the percentage of first-year teachers in the school. In schools with a higher proportion of new teachers, the presence of counselors may be essential, as first-year teachers may need more support and guidance when managing student behavior.

Table 13 presents the second-stage IV heterogeneous effects by the proportion of first-year teachers. Although the interaction coefficients for middle schools are not statistically significant, they are positive across all disciplinary measures. This suggests that counselors may have a beneficial impact in middle schools that employ a higher proportion of first-year teachers.

For the number of students with disciplinary measures (Panel A) and the number of students with suspensions (Panel B), the interaction coefficient is positive and statistically significant in high schools. This implies that in high schools with a higher propor-

tion of first-year teachers—where their support may be more needed—the presence of counselors has a greater effect on reducing disciplinary measures. The main effect of the student-to-counselor ratio is also positive, suggesting that the impact of counselors on disciplinary actions may be less pronounced in schools with fewer first-year teachers.

Figure 4 presents the marginal effect of the student-to-counselor ratio and the distribution of high schools by the percentage of first-year teachers. The marginal effect of counselors is positive and statistically significant across all schools, regardless of the proportion of first-year teachers, and it increases progressively as this percentage rises. This suggests that counselors are particularly effective in schools with more new teachers, potentially helping to alleviate the challenges these educators face in managing student behavior. According to the histogram, the marginal effect of counselors ranges from 0.2 to 1 student with disciplinary measures in most high schools, as the majority have less than 10% first-year teachers.

These results suggest that counselors may provide essential support in managing misbehavior in high schools with a higher percentage of new teachers, allowing these instructors to focus more on teaching and less on disciplinary issues.

5.3.3 Number of Administrative Staff

Finally, considering that the school counselor's role is broad in nature—including helping students with behavioral problems, establishing academic goals, resolving interpersonal conflicts with other students, and working with parents and teachers—this often leads to misconceptions. As a result, school counselors are frequently assigned several administrative duties, which remove them from providing direct counseling services to students. In fact, the American School Counselor Association (ASCA) defines these tasks as "inappropriate activities for school counselors" in its National Model (ASCA, 2012).

Since the number of administrative staff may be endogenously related to the presence

of counselors in educational institutions, these results should be interpreted with caution and considered speculative.

If school counselors and administrative staff are complements, the interaction coefficient should be positive and statistically significant. In that case, increasing the student-to-counselor ratio (when interacted with administrative staff) would lead to higher disciplinary measures, and vice versa.

Table 14 presents the second-stage IV results for several disciplinary outcomes: the number of students with disciplinary measures (Panel A), the number of students with suspensions (Panel B), students transferred for disciplinary reasons (Panel C), and students with an expulsion (Panel D). For middle schools, neither the student-to-counselor coefficient nor the interaction term is statistically significant for any of the four outcomes. However, the interaction positive coefficient suggests some degree of complementarity between counselors and administrative staff.

In high schools, compared to the main specifications in Tables 5 to 8, the coefficient for the student-to-counselor ratio decreases in magnitude and is no longer statistically significant for any of the four outcomes. However, the estimated interaction coefficients are positive and statistically significant across all four disciplinary measures. These results suggest that counselors in high schools may only effectively reduce exclusionary disciplinary measures when administrative staff are also present.

To better understand these complementarities, I present marginal effects on the number of students with disciplinary measures and the distribution of high schools by the number of administrative staff in Figure 5. The first thing to note is the low proportion of high schools with no administrative staff. The marginal effect of counselors increases non-linearly with the number of administrative staff in schools, forming a concave curve. For schools with fewer than two administrative staff, the effect is not statistically different from zero. The largest marginal effect occurs in schools with around 10 to 11 administrative staff. Most schools have between 2 and 5 administrative staff, with marginal effects

between 0.2 and 1 student with disciplinary measures.

This analysis reveals a (speculative) complementary relationship between school counselors and administrative staff. It also suggests that most high schools could enhance the efficacy of their counselors by hiring more administrative staff, as most of these schools have fewer administrative staff than the number that maximizes the marginal effect of counselors. Finally, since the average number of administrative staff is higher in high schools (4.1) than in middle schools (3.2), this complementarity may partially explain the overall greater efficacy of counselors in high schools compared to middle schools.

6 Conclusion

This paper leverages state-mandated student-to-counselor ratios to estimate the effect of reducing the number of students per counselor on exclusionary disciplinary measures in secondary schools across 27 states. The IV estimates show that an increase in counselor presence significantly reduces suspensions, expulsions, and transfers, though it does not affect school-related arrests. Effects are more precisely estimated in high schools, where statistical significance is higher than in middle schools.

Two main mechanisms may explain these findings. First, counselors may help students manage personal challenges through socio-emotional support. Second, they may influence school policies by promoting alternatives to traditional, exclusionary discipline methods. The study indicates that the impact of counselors likely stems more from their effect on institutional discipline practices than on direct changes in student behavior, as results show that offenses and bullying are not substantially reduced.

Heterogeneity analysis reveals that counselors are particularly effective in schools with a larger share of disadvantaged students and first-year teachers, suggesting their role extends to supporting less-experienced teachers. Moreover, findings suggest that counselors' effectiveness is enhanced when administrative staff are present, likely be-

cause it enables counselors to focus on their primary roles.

This study fills an important gap in the literature by focusing on secondary education, building on earlier studies that mostly studied counselors' effect on disciplinary outcomes in elementary schools. Also, unlike studies restricted to a single district or state, this study uses data from 27 states tackling an external validity concern.

Beyond the immediate behavioral results in schools, there are significant far-reaching implications to lessening the use of exclusionary disciplinary methods like suspensions and expulsions. These measures are closely linked to detrimental long-term outcomes, such as a higher risk of involvement in the criminal justice system and worse academic achievement (Bacher-Hicks et al., 2019; Fabelo et al., 2011; Wolf and Kupchik, 2017). Consequently, new approaches to addressing school conflicts and misbehavior, such as 'restorative practices,' have begun to be implemented and show promising results compared to traditional disciplinary measures (Gregory et al., 2018; Shem-Tov et al., 2024).

In addition to creating safer and more welcoming learning environments, schools can help end cycles of injustice by changing their disciplinary policies from exclusionary to supportive, restorative methods led by counselors. For students from disadvantaged families, who are disproportionately impacted by severe disciplinary methods, these policy changes are especially important. In the end, counselors contribute to educational equity and lower the societal costs of exclusionary discipline practices by assisting schools in using non-punitive ways to discipline.

As the identification strategy focuses on schools that currently have at least one counselor, this study estimates the effect of counselors on disciplinary outcomes on the intensive margin. Since more than 70% of U.S. schools employ at least one counselor, the results are still generally applicable even when schools without counselors are not included in the analysis. Therefore, the findings provide important insights into how the availability of extra counseling resources can affect school discipline where counselors are already incorporated, even though they might not directly apply to the very small sub-

set of schools lacking counselor resources. Although the current findings demonstrate the important role counselors play in changing disciplinary practices in most secondary school environments, further research may examine the effects of counselor interventions in settings where counselors are not currently present.

Although this study offers insightful information on how counselors affect disciplinary outcomes, further research is needed to fully understand how these impacts vary in various school settings and demographic contexts. Future research should examine how counselor interventions work in schools with different administrative support systems or disciplinary cultures. To determine whether interdisciplinary teams further strengthen the shift from exclusionary discipline, studies might also look at the effects of other SBMH practitioners, including social workers and psychologists, working with counselors. A more comprehensive approach to dealing with student behavior and fostering positive school climates may result from an understanding of the complementing effects of different school resources.

Finally, policymakers looking to tackle students' behavioral problems in middle and high public schools should consider counselors a valuable resource. While counselors' effectiveness has been documented, there seems to be room for improvement. Increasing schools' administrative personnel and creating adequately staffed SBMH professional teams seems to help attend to complex problems like students' misbehavior and school conflicts, which are likely better handled by multidisciplinary teams.

REFERENCES

Angrist, J. D., Battistin, E., & Vuri, D. (2017). In a small moment: Class size and moral hazard in the Italian Mezzogiorno. *American Economic Journal: Applied Economics*, *9*(4), 216–249.

Angrist, J. D., & Lavy, V. (1999). Using Maimonides' rule to estimate the effect of class size on scholastic achievement. *The Quarterly journal of economics*, *114*(2), 533–575.

Angrist, J. D., Lavy, V., Leder-Luis, J., & Shany, A. (2019). Maimonides rule redux. *American Economic Review: Insights*, *1*(3), 309–324.

Arcia, E. (2006). Achievement and enrollment status of suspended students: Outcomes in a large, multicultural school district. *Education and urban society*, *38*(3), 359–369.

ASCA. (2012). *ASCA National Model: A framework for school counseling programs*. American School Counselor Association.

Bacher-Hicks, A., Billings, S. B., & Deming, D. J. (2019). The school to prison pipeline: Long-run impacts of school suspensions on adult crime.

Ballatore, R. M., Fort, M., & Ichino, A. (2018). Tower of Babel in the classroom: immigrants and natives in Italian schools. *Journal of Labor Economics*, *36*(4), 885–921.

Bingley, P., Jense, V., & Walker, I. (2005). The effects of class size on educational attainment: Danish quasi-experimental evidence and evidence that controls for family, school and neighbourhood effects. *Unpublished manuscript*.

Bonesrønning, H. (2003). Class size effects on student achievement in Norway: Patterns and explanations. *Southern Economic Journal*, *69*(4), 952–965.

Browning, M., & Heinesen, E. (2007). Class size, teacher hours and educational attainment. *Scandinavian Journal of Economics*, *109*(2), 415–438.

Calonico, S., Cattaneo, M. D., Farrell, M. H., & Titiunik, R. (2017). rdrobust: Software for regression-discontinuity designs. *The Stata Journal*, *17*(2), 372–404.

Calonico, S., Cattaneo, M. D., & Titiunik, R. (2015). Optimal data-driven regression discontinuity plots. *Journal of the American Statistical Association*, *110*(512), 1753–1769.

Card, D., Lee, D. S., Pei, Z., & Weber, A. (2015). Inference on causal effects in a generalized regression kink design. *Econometrica*, *83*(6), 2453–2483.

Carrell, S. E., & Carrell, S. A. (2006). Do lower student to counselor ratios reduce school disciplinary problems? *The BE Journal of Economic Analysis & Policy*, *5*(1), 000010151515380645 1463.

Carrell, S. E., & Hoekstra, M. (2014). Are school counselors an effective education input? *Economics Letters*, *125*(1), 66–69.

Castleman, B., & Goodman, J. (2018). Intensive college counseling and the enrollment and persistence of low-income students. *Education Finance and Policy*, *13*(1), 19–41.

Cattaneo, M. D., Jansson, M., & Ma, X. (2020). Simple local polynomial density estimators. *Journal of the American Statistical Association*, *115*(531), 1449–1455.

Cattaneo, M. D., Jansson, M., & Ma, X. (2021). Local regression distribution estimators. *Journal of econometrics*, 105074.

Dobbelsteen, S., Levin, J., & Oosterbeek, H. (2002). The causal effect of class size on scholastic achievement: distinguishing the pure class size effect from the effect of changes in class composition. *Oxford Bulletin of Economics and statistics*, *64*(1), 17–38.

Fabelo, T., Thompson, M. D., Plotkin, M., Carmichael, D., Marchbanks, M. P., & Booth, E. A. (2011). Breaking schools' rules: A statewide study of how school discipline relates to students' success and juvenile justice involvement. *New York: Council of State Governments Justice Center*.

Gary-Bobo, R. J., & Mahjoub, M.-B. (2013). Estimation of class-Size effects, using" Maimonides' Rule" and other instruments: The case of French junior high schools. *Annals of Economics and Statistics/ANNALES D'ÉCONOMIE ET DE STATISTIQUE*, 193–225.

Gregory, A., Huang, F. L., Anyon, Y., Greer, E., & Downing, B. (2018). An examination of restorative interventions and racial equity in out-of-school suspensions. *School Psychology Review*, *47*(2), 167–182.

Guzman, G., & Kollar, M. (2024). *Income in the united states: 2023* (P60-282). U.S. Census Bureau. https://www2.census.gov/library/publications/2024/demo/p60-282.pdf

Gysbers, N. C. (2012). Embrace the past, welcome the future: A brief history of school counseling. *American School Counselor Association,(Ed.).(2012). The ASCA national model: A framework for school counseling programs. Alexandria, VA: Author*.

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica*, *69*(1), 201–209.

Hanushek, E. A. (1996). Measuring investment in education. *Journal of economic perspectives*, *10*(4), 9–30.

Heled, E., & Davidovitch, N. (2020). An Occupation in Search of Identity–What Is School Counseling? *Journal of Education and Learning*, *9*(5), 215–232.

Hoxby, C. M. (2000). The effects of class size on student achievement: New evidence from population variation. *The quarterly journal of economics*, *115*(4), 1239–1285.

Hurwitz, M., & Howell, J. (2014). Estimating causal impacts of school counselors with regression discontinuity designs. *Journal of Counseling & Development*, *92*(3), 316–327.

Hwang, N., & Domina, T. (2021). Peer disruption and learning: Links between suspensions and the educational achievement of non-suspended students. *Education Finance and Policy*, *16*(3), 443–463.

Irwin, V., De La Rosa, J., Wang, K., Hein, S., Zhang, J., Burr, R., Roberts, A., Barmer, A., Bullock Mann, F., Dilig, R., et al. (2022). Report on the Condition of Education 2022. NCES 2022-144. *National Center for Education Statistics*.

Kristoffersen, J. H. G., Krægpøth, M. V., Nielsen, H. S., & Simonsen, M. (2015). Disruptive school peers and student outcomes. *Economics of Education Review*, *45*, 1–13.

Krueger, A. B. (1998). Reassessing the view that American schools are broken. *Economic Policy Review*, *4*(1).

Lacoe, J., & Steinberg, M. P. (2019). Do suspensions affect student outcomes? *Educational Evaluation and Policy Analysis*, *41*(1), 34–62.

Lavy, V., Silva, O., & Weinhardt, F. (2012). The good, the bad, and the average: Evidence on ability peer effects in schools. *Journal of Labor Economics*, *30*(2), 367–414.

Lazear, E. P. (2001). Educational production. *The Quarterly Journal of Economics*, *116*(3), 777–803.

Lee, D. S., McCrary, J., Moreira, M. J., & Porter, J. (2022). Valid t-ratio Inference for IV. *American Economic Review*, *112*(10), 3260–3290.

Leuven, E., Oosterbeek, H., & Rønning, M. (2008). Quasi-experimental estimates of the effect of class size on achievement in Norway. *The Scandinavian Journal of Economics*, *110*(4), 663–693.

LiCalsi, C., Osher, D., & Bailey, P. (2021). An empirical examination of the effects of suspension and suspension severity on behavioral and academic outcomes. *American Institutes for Research*, *8*.

Lin, L., Parker, K., & Horowitz, J. M. (2024, April). *What's It Like To Be a Teacher in America Today?* Pew Research Center. https://www.pewresearch.org/social-trends/2024/04/04/whats-it-like-to-be-a-teacher-in-america-today/

Mai, C., & Subramanian, R. (2017). *The price of prisons: Examining state spending trends, 2010-2015*. Vera Institute of Justice. https://vera-institute.files.svdcdn.com/production/downloads/publications/the-price-of-prisons-2015-state-spending-trends.pdf

Mann, A., Whitaker, A., Torres-Gullien, S., Morton, M., Jordan, H., Coyle, S., & Sun, W.-L. (2019). Cops & no counselors: How the lack of school mental health staff is harming students.

Marchbanks III, M. P., Blake, J. J., Booth, E. A., Carmichael, D., Seibert, A. L., & Fabelo, T. (2015). The economic effects of exclusionary discipline on grade retention and high school dropout. *Closing the school discipline gap: Equitable remedies for excessive exclusion*, 59–74.

McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of econometrics*, *142*(2), 698–714.

Mulhern, C. (2020). Beyond teachers: Estimating individual guidance counselors' effects on educational attainment. *Unpublished Manuscript, RAND Corporation*.

Murnane, R. J., Willett, J. B., & Tyler, J. H. (2000). Who benefits from obtaining a ged? evidence from high school and beyond. *The Review of Economics and Statistics*, *82*(1), 23–37. https://doi.org/10.1162/003465300558605

Nance, J. P. (2015). Students, police, and the school-to-prison pipeline. *Wash. UL Rev.*, *93*, 919.

Perera, R. M., & Diliberti, M. K. (2023). Survey: Principals say they need better-trained teachers and more resources to address student misbehavior. *Brookings Institution*. https://www.brookings.edu/articles/survey-principals-say-they-need-better-trained-teachers-and-more-resources-to-address-student-misbehavior/

Piketty, T. (2004). Should we reduce class size or school segregation? Theory and evidence from France. *PSE, Jourdan, ENS, Paris, France*.

Reback, R. (2010). Noninstructional spending improves noncognitive outcomes: Discontinuity evidence from a unique elementary school counselor financing system. *Education Finance and Policy*, *5*(2), 105–137.

Shem-Tov, Y., Raphael, S., & Skog, A. (2024). Can Restorative Justice Conferencing Reduce Recidivism? Evidence From the Make-it-Right Program. *Econometrica*, *92*(1), 61–78.

Todd, P. E., & Wolpin, K. I. (2003). On the specification and estimation of the production function for cognitive achievement. *The Economic Journal*, *113*(485), F3–F33.

Urquiola, M. (2006). Identifying class size effects in developing countries: Evidence from rural Bolivia. *Review of Economics and statistics*, *88*(1), 171–177.

Urquiola, M., & Verhoogen, E. (2009). Class-size caps, sorting, and the regression-discontinuity design. *American Economic Review*, *99*(1), 179–215.

U.S. Bureau of Labor Statistics. (2023). Education pays. https://www.bls.gov/emp/tables/unemployment-earnings-education.htm

U.S. Department of Education, Office for Civil Rights. (2023). 2020-21 civil rights data collection. a first look: Students' access to educational opportunities in u.s. public schools. https://www.ed.gov/sites/ed/files/about/offices/list/ocr/docs/crdc-educational-opportunities-report.pdf

Wang, L., Zhang, Y., Chen, L., Wang, J., Jia, F., Li, F., Froehlich, T. E., Hou, Y., Hao, Y., Shi, Y., et al. (2021). Psychosocial and behavioral problems of children and adolescents in the early stage of reopening schools after the COVID-19 pandemic: a national cross-sectional study in China. *Translational psychiatry*, *11*(1), 342.

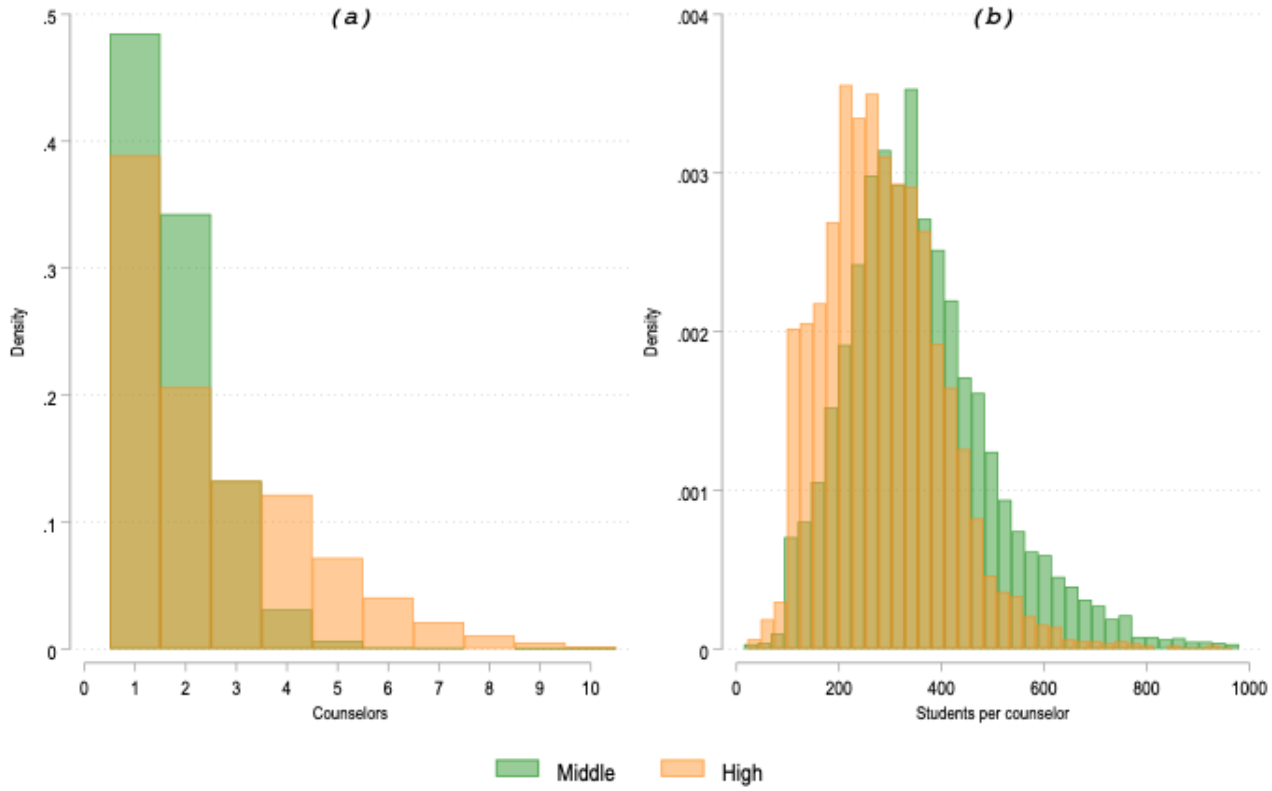
Woessmann, L. (2005). Educational production in Europe. *Economic policy*, *20*(43), 446–504.

Wolf, K. C., & Kupchik, A. (2017). School suspensions and adverse experiences in adulthood. *Justice Quarterly*, *34*(3), 407–430.

Zabek, F., Lyons, M. D., Alwani, N., Taylor, J. V., Brown-Meredith, E., Cruz, M. A., & Southall, V. H. (2023). Roles and functions of school mental health professionals within comprehensive school mental health systems. *School Mental Health*, *15*(1), 1–18.

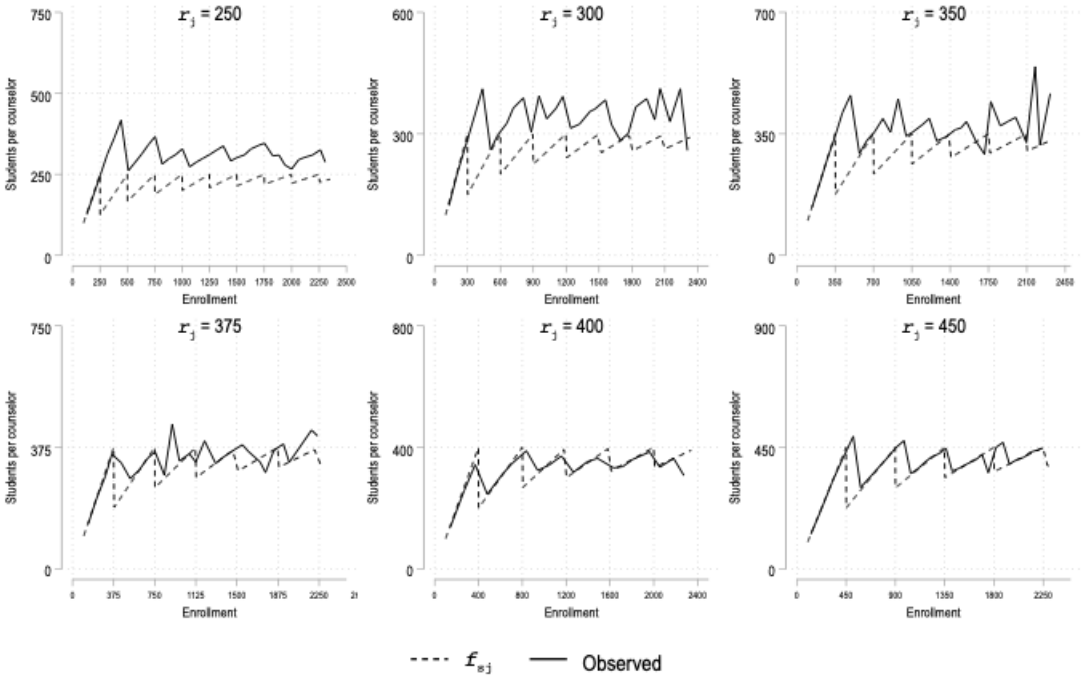
Figures

Figure 1: Distribution of Schools by Number of Counselors and Students per Counselor



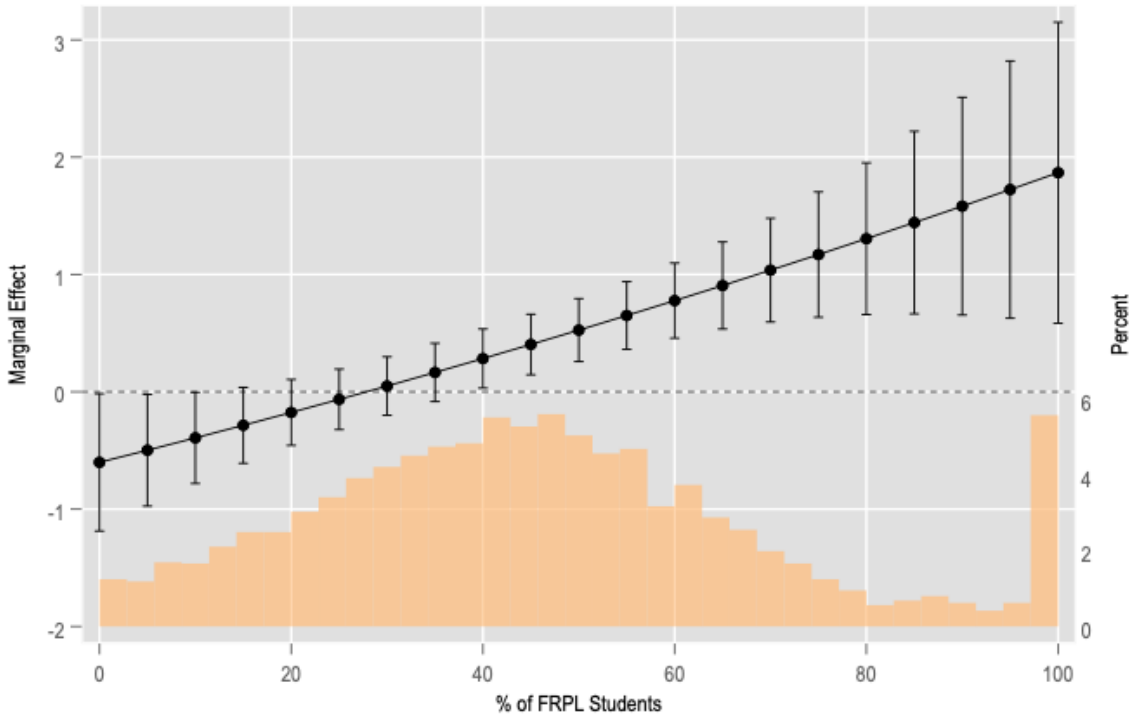
Notes: Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, the distributions in these plots were trimmed at 10 counselors *(a)* and 1,000 students per counselor *(b)*. ($N = 10,742$)

Figure 2: Observed and Recommended/Mandated Student to Counselor Ratio by r_j



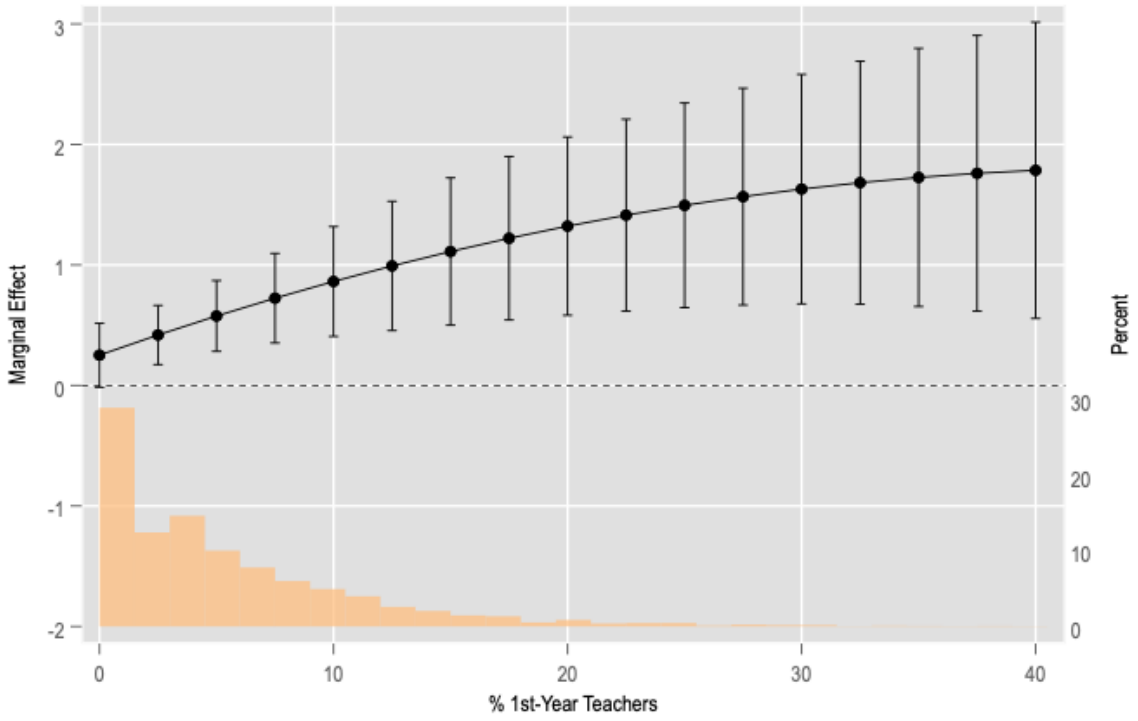
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure 3: Students per Counselor Marginal Effect by % of FRPL Students on Number of Students with Disciplinary Measures



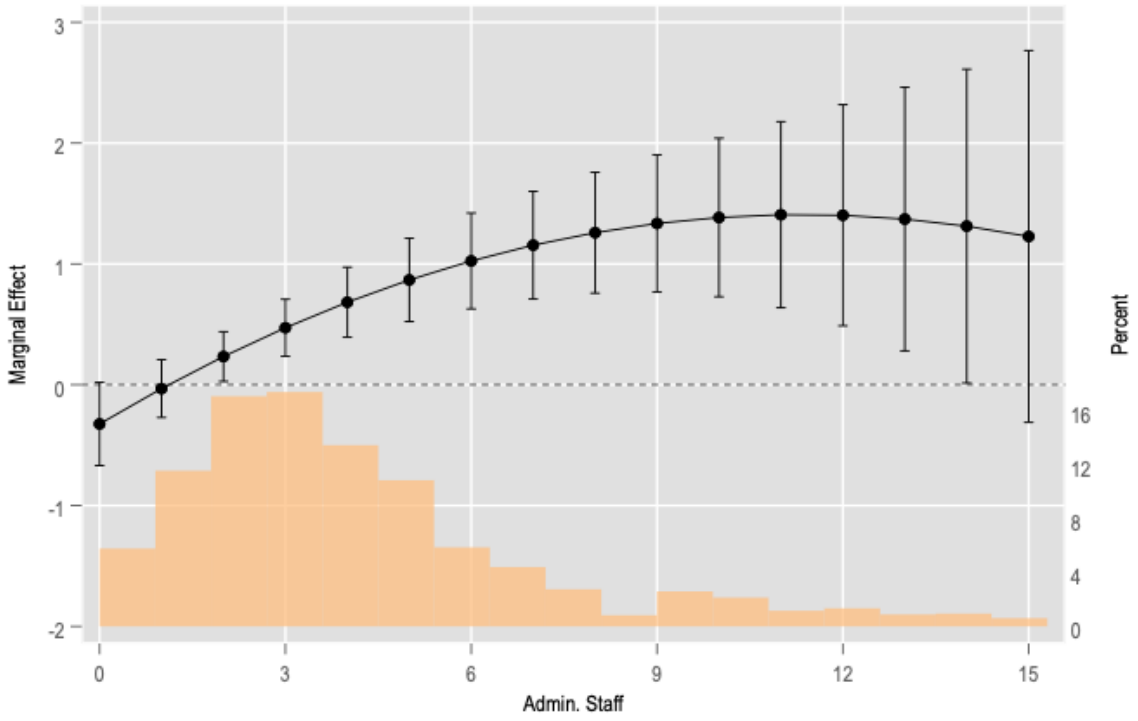
Notes: High schools in states with a mandate for counseling services, with at least one counselor, with enrollment between 100 and 2,350 students, and enrollment of $-/+100$ students around the closer discontinuity determined by the corresponding r_j. The histogram shows the distribution of high schools by the percentage of FRPL students. Marginal effects are estimated by an IV model with a quadratic polynomial of the percentage of FRPL students. Covariates included are an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of URM students, and the proportion of LEP students. Juvenile justice facilities, special education schools, and alternative schools were excluded. $N = 3,361$.

Figure 4: Students per Counselor Marginal Effect by % of 1st-Year Teachers on Number of Students with Disciplinary Measures



Notes: High schools in states with a mandate for counseling services, with at least one counselor, with enrollment between 100 and 2,350 students, and enrollment of $-/+100$ students around the closer discontinuity determined by the corresponding r_j. The histogram shows the distribution of high schools by the percentage of 1st-year teachers. Marginal effects are estimated by an IV model with a quadratic polynomial of the percentage of 1st-year teachers. Covariates included are an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of URM students, and the proportion of LEP students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Distribution truncated at schools with 40% of 1st-year teachers. $N = 3,357$.

Figure 5: Students per Counselor Marginal Effect by Admin. Staff on Number of Students with Disciplinary Measures



Notes: High schools in states with a mandate for counseling services, with at least one counselor, with enrollment between 100 and 2,350 students, and enrollment of $-/+100$ students around the closer discontinuity determined by the corresponding r_j. The histogram shows the distribution of high schools by the number of administrative staff. Marginal effects are estimated by an IV model with a quadratic polynomial of the number of administrative staff. Covariates included are an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Distribution truncated at schools with 15 administrative staff. $N = 3,260$.

Tables

Table 1: States Mandated or Recommended Student-to-Counselor Ratios

States	**Ratio mandate/recommended**
ID MD NC NJ NM NV OR RI WI WV WY	ASCA recommendation 1:250
IN ND NH VT	1:300 (IN recommendation only)
IA TN	1:350 (Recommended only)
MO	1:375
MT UT	1:400
AR GA LA OK	1:450
ME	Middle 1:350 High 1:250
AL	0.5 counselors if enrollment $<$ 500. 1 counselor if 500 $\leq$ enrollment $\leq$ 749. 2 counselors if 750 $\leq$ enrollment $\leq$ 999. 2.5 counselors if 1,000 $\leq$ enrollment $\leq$ 1,249. 3 if 1,250 $\leq$ enrollment.
NE	When enrollment hits 450, 1 school counselor must be assigned. Thereafter, an additional 0.5 is assigned for each 225 students.

Notes: States with a mandate for counseling services in schools. DC, MS, and WA were excluded, as their mandates do not establish student-to-counselor ratios inducing discontinuities (e.g., a minimum of one counselor per school).

Table 2: School Characteristics by Number of Counselors

	Middle				High			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
1 Counselor		*(N = 2,457)*				*(N = 2,198)*		
Students-to-counselor ratio	388	179	100	1,219	286	167	100	2,225
Enrollment	388	179	100	1,219	286	167	100	2,225
% Female students	48.4	3.5	0.0	100	49.1	6.3	0.0	100
% FRPL students	55.5	23.7	0.0	100	50.3	22.0	0.0	100
% URM students	28.4	28.2	0.0	100	23.4	27.1	0.0	100
% LEP students	3.6	6.9	0.0	100	1.9	4.9	0.0	100
2 Counselors		*(N = 1,736)*				*(N = 1,166)*		
Students-to-counselor ratio	347	102	56	829	294	121	50	923
Enrollment	695	203	111	1,658	589	242	100	1,845
% Female students	48.7	2.4	38.6	66	49.2	5.3	0.0	100
% FRPL students	51.5	25.3	0.0	100	50.1	22.8	0.0	100
% URM students	36.1	28.5	0.0	100	28.7	30.1	0.0	100
% LEP students	4.9	7.3	0.0	67	2.9	6.6	0.0	100
3+ Counselors		*(N = 875)*				*(N = 2,310)*		
Students-to-counselor ratio	300	99	15	719	289	94	22	724
Enrollment	975	313	123	2,226	1,251	467	108	2,349
% Female students	48.7	2.2	33.9	63	49.0	3.7	0.0	100
% FRPL students	42.8	26.5	0.0	100	43.4	24.1	0.0	100
% URM students	36.5	27.7	1.8	100	35.5	29.3	0.9	100
% LEP students	5.6	7.8	0.0	100	3.7	5.9	0.0	49

Notes: Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. FRPL = Free or Reduced Price Lunch, URM = Unrepresented Minority, LEP = Limited English Proficient.

Table 3: Disciplinary Measures by Number of Counselors

	Middle				High			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
1 Counselor		*(N = 2,457)*				*(N = 2,198)*		
N Students Suspended	77.88	82.11	0	762	44.95	63.04	0	1,105
N Students Transferred	1.089	4.425	0	70	0.635	3.932	0	101
N Students Expelled	2.048	6.220	0	96	1.878	7.377	0	154
N Students Arrested	0.483	2.324	0	37	0.529	6.906	0	312
2 Counselors		*(N = 1,736)*				*(N = 1,166)*		
N Students Suspended	148.99	119.79	0	863	110.9	110.4	0	923
N Students Transferred	2.362	6.526	0	72	2.522	9.451	0	159
N Students Expelled	3.516	9.851	0	203	4.781	12.33	0	162
N Students Arrested	0.998	3.575	0	51	1.349	4.109	0	42
3+ Counselors		*(N = 875)*				*(N = 2,310)*		
N Students Suspended	156.20	136.89	0	946	216.9	190.9	0	1,462
N Students Transferred	1.803	5.068	0	50	3.937	10.28	0	139
N Students Expelled	2.735	9.639	0	186	6.968	15.58	0	173
N Students Arrested	1.770	7.280	0	143	3.423	9.146	0	120

Notes: Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. N Students Suspended = Number of Students With In- and Out-of-School Suspensions, N Students Transferred = Number of Students Transferred to Another School for Disciplinary Reasons, N Students Expelled = Number of Students Who Received an Expulsion, N Students Arrested = Number of Students Who Received a School-Related Arrest.

Table 4: Instrumental Variables First-Stage

	Middle			High		
Dep. Var.: Students per counselor	(1)	(2)	(3)	(4)	(5)	(6)
f_{sj}	0.632***	0.298***	0.275***	0.745***	0.543***	0.544***
	(0.037)	(0.046)	(0.047)	(0.023)	(0.029)	(0.028)
Enrollment		0.481***	0.518***		0.178***	0.191***
		(0.058)	(0.059)		(0.015)	(0.016)
Enrollment sq/100		-0.020***	-0.021***		-0.006***	-0.006***
		(0.004)	(0.004)		(0.001)	(0.001)
Covariates	*No*	*No*	*Yes*	*No*	*No*	*Yes*
Observations	5,068	5,068	5,068	5,674	5,674	5,674
F-statistic	292.0	41.30	34.50	1,013	352.6	368.3
Partial R-squared	0.114	0.028	0.015	0.244	0.122	0.085

Notes: The student-to-counselor ratio function (f_{sj}) instruments for the number of students per counselor. Covariates included are a quadratic polynomial of total enrollment, indicator variables for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 5: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students with Disciplinary Measures

	Middle				**High**			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	0.013	0.269**	0.552	0.595	0.027	0.307***	0.535***	0.575***
	(0.017)	(0.111)	(0.404)	(0.451)	(0.022)	(0.056)	(0.124)	(0.172)
Dep. Var. Mean	121.0	121.0	121.6	122.8	137.3	137.3	146.7	145.2
Observations	5,068	5,068	3,141	1,609	5,674	5,674	3,361	1,660

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. The outcome variable counts each student once per type of disciplinary measure received. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 6: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students with In- and Out-of-school Suspensions

	Middle				**High**			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	0.008	0.211**	0.398	0.447	0.013	0.234***	0.422***	0.464***
	(0.016)	(0.103)	(0.350)	(0.390)	(0.019)	(0.052)	(0.116)	(0.159)
Dep. Var. Mean	115.8	115.8	116.6	117.2	128.5	128.5	138.0	136.9
Observations	5,068	5,068	3,141	1,609	5,674	5,674	3,361	1,660

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 7: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students Transferred to Another School for Disciplinary Reasons

	Middle				**High**			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	0.002**	0.029***	0.070*	0.038	0.004**	0.037***	0.059***	0.066***
	(0.001)	(0.009)	(0.041)	(0.032)	(0.002)	(0.006)	(0.013)	(0.019)
Dep. Var. Mean	1.648	1.648	1.554	1.658	2.367	2.367	2.381	2.300
Observations	5,068	5,068	3,141	1,609	5,674	5,674	3,361	1,660

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 8: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students Who Received an Expulsion

	Middle				High			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	0.004***	0.024**	0.063	0.076	0.010***	0.034***	0.047***	0.039**
	(0.001)	(0.011)	(0.045)	(0.055)	(0.003)	(0.006)	(0.013)	(0.016)
Dep. Var. Mean	2.669	2.669	2.564	2.890	4.547	4.547	4.437	4.248
Observations	5,068	5,068	3,141	1,609	5,674	5,674	3,361	1,660

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 9: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students Who Received a School-Related Arrest

	Middle				High			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	-0.001	0.005	0.020	0.033	-0.000	0.002	0.008*	0.006
	(0.001)	(0.004)	(0.017)	(0.025)	(0.001)	(0.003)	(0.004)	(0.005)
Dep. Var. Mean	0.882	0.882	0.912	1.017	1.875	1.875	1.872	1.792
Observations	5,068	5,068	3,141	1,609	5,674	5,674	3,361	1,660

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 10: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Students Reported as Harassed or Bullied

	Middle				**High**			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	-0.002***	0.015**	0.065*	0.074	-0.002***	-0.000	0.005	0.007
	(0.001)	(0.008)	(0.038)	(0.046)	(0.000)	(0.001)	(0.003)	(0.005)
Dep. Var. Mean	2.483	2.483	2.724	2.775	1.518	1.518	1.742	1.651
Observations	5,034	5,034	3,121	1,601	5,648	5,648	3,347	1,652

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. The dependent variable includes students who reported being harassed or bullied based on sex, color, or disability. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 11: OLS and IV Second-Stage Estimates
Dep. Var.: Number of Offenses to Students, Faculty or Staff

	Middle				**High**			
	OLS	IV 2nd-Stage			OLS	IV 2nd-Stage		
	All	*All*	*-/+ 100*	*-/+ 50*	*All*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Students per counselor	-0.010	-0.002	-0.013	-0.068	-0.002	-0.005	-0.025	-0.011
	(0.010)	(0.065)	(0.185)	(0.169)	(0.008)	(0.015)	(0.024)	(0.035)
Dep. Var. Mean	27.96	27.96	28.53	28.22	16.81	16.81	18.29	18.22
Observations	5,035	5,035	3,117	1,595	5,653	5,653	3,349	1,655

Notes: Instrumental variables models are estimated by 2SLS, and the student-to-counselor ratio function (f_{sj}) instruments for students per counselor. Covariates included are a quadratic polynomial of total enrollment, an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. The dependent variable includes offenses to students, faculty, and administrative staff such as sexual assault, robbery, physical attack, threats of physical attack, and possession of a weapon. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 12: IV 2nd-Stage Estimates
(Speculative) Heterogeneous Effects by % of FRPL Students

	Middle			High		
	All	*-/+ 100*	*-/+ 50*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of students with disciplinary measures						
Students per counselor	-0.386***	-0.235	-0.173	-0.510***	-0.562**	-0.408
	(0.120)	(0.419)	(0.451)	(0.117)	(0.242)	(0.257)
Students per counselor × Perc. FRPL	0.013***	0.017***	0.017***	0.017***	0.023***	0.021***
	(0.002)	(0.005)	(0.006)	(0.002)	(0.006)	(0.007)
Panel B: Number of students with in- and out-of-school suspensions						
Students per counselor	-0.385***	-0.307	-0.245	-0.514***	-0.564**	-0.401*
	(0.112)	(0.359)	(0.391)	(0.107)	(0.220)	(0.229)
Students per counselor × Perc. FRPL	0.012***	0.016***	0.015***	0.015***	0.020***	0.019***
	(0.002)	(0.004)	(0.006)	(0.002)	(0.005)	(0.006)
Panel C: Number of students transferred to another school for disciplinary reasons						
Students per counselor	0.001	0.031	0.013	0.010	0.005	0.007
	(0.009)	(0.041)	(0.029)	(0.008)	(0.017)	(0.020)
Students per counselor × Perc. FRPL	0.001***	0.001**	0.001*	0.001***	0.001***	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Panel D: Number of students received an expulsion						
Students per counselor	-0.003	0.025	0.038	-0.002	-0.009	-0.016
	(0.011)	(0.045)	(0.054)	(0.012)	(0.021)	(0.024)
Students per counselor × Perc. FRPL	0.001***	0.001**	0.001	0.001***	0.001**	0.001*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Observations	5,068	3,141	1,609	5,674	3,361	1,660

Notes: Models estimated by 2SLS. The student-to-counselor ratio function (f_{sj}) and its interaction with the heterogeneity variable instrument for the students per counselor and for its interaction with the heterogeneity variable. Covariates included a quadratic polynomial of total enrollment, the heterogeneity variable, an indicator for schools in states with ratio mandates, an indicator for schools in states with ratio recommendations, an indicator for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 13: IV 2nd-Stage Estimates
(Speculative) Heterogeneous Effects by % of First-year Teachers

	Middle			High		
	All	*-/+ 100*	*-/+ 50*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of students with disciplinary measures						
Students per counselor	0.173	-0.238	-0.110	0.225***	0.283**	0.371**
	(0.110)	(1.050)	(0.911)	(0.066)	(0.134)	(0.185)
Students per counselor × Perc. FYT	0.017*	0.144	0.088	0.014**	0.057**	0.047
	(0.009)	(0.239)	(0.129)	(0.006)	(0.026)	(0.034)
Panel B: Number of students with in- and out-of-school suspensions						
Students per counselor	0.120	-0.313	-0.236	0.160***	0.198	0.265
	(0.102)	(0.937)	(0.856)	(0.060)	(0.124)	(0.174)
Students per counselor × Perc. FYT	0.017**	0.131	0.085	0.013**	0.050**	0.046
	(0.008)	(0.212)	(0.121)	(0.006)	(0.022)	(0.030)
Panel C: Number of students transferred to another school for disciplinary reasons						
Students per counselor	0.025***	0.017	0.021	0.033***	0.042***	0.058***
	(0.008)	(0.076)	(0.036)	(0.007)	(0.014)	(0.022)
Students per counselor × Perc. FYT	0.001	0.010	0.002	0.001	0.004	0.002
	(0.001)	(0.017)	(0.004)	(0.001)	(0.002)	(0.003)
Panel D: Number of students received an expulsion						
Students per counselor	0.023**	0.032	0.060	0.031***	0.033***	0.039**
	(0.010)	(0.054)	(0.066)	(0.007)	(0.013)	(0.016)
Students per counselor × Perc. FYT	0.000	0.005	0.002	0.001	0.003	0.000
	(0.001)	(0.011)	(0.006)	(0.001)	(0.002)	(0.003)
Observations	5,067	3,141	1,609	5,673	3,361	1,660

Notes: Models estimated by 2SLS. The student-to-counselor ratio function (f_{sj}) and its interaction with the heterogeneity variable instrument for the students per counselor and for its interaction with the heterogeneity variable. FYT = first-year teachers. Covariates included a quadratic polynomial of total enrollment, the heterogeneity variable, an indicator for schools in states with ratio mandates, an indicator for schools in states with ratio recommendations, an indicator for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 14: IV 2nd-Stage Estimates
(Speculative) Heterogeneous Effects by Number of Administrative Staff

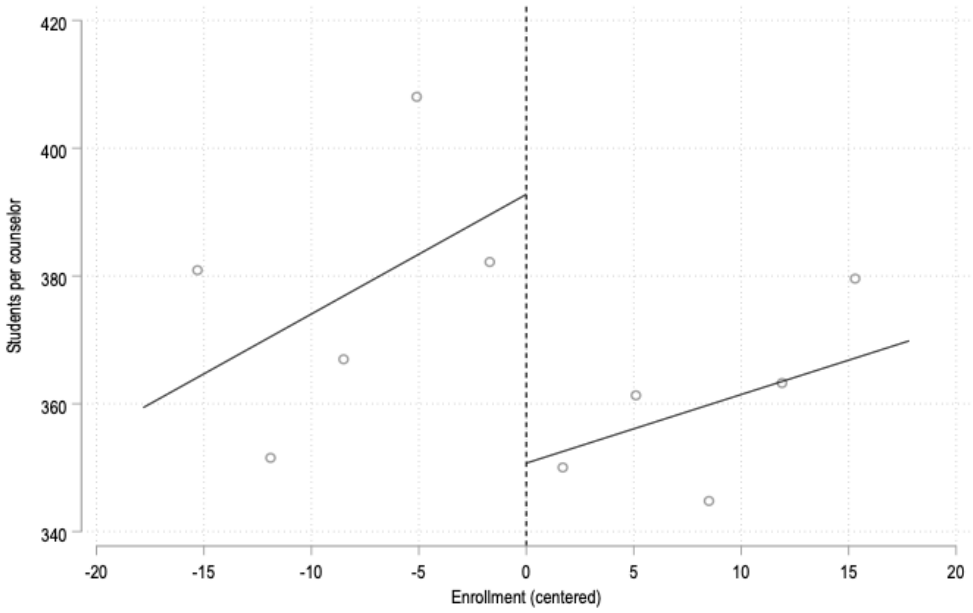
	Middle			High		
	All	*-/+ 100*	*-/+ 50*	*All*	*-/+ 100*	*-/+ 50*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of students with disciplinary measures						
Students per counselor	0.165	0.396	0.487	0.010	0.090	0.116
	(0.112)	(0.426)	(0.500)	(0.071)	(0.159)	(0.206)
Students per counselor × N Admin.	0.038	0.052	0.043	0.088***	0.110**	0.112**
	(0.025)	(0.042)	(0.041)	(0.023)	(0.046)	(0.053)
Panel B: Number of students with in- and out-of-school suspensions						
Students per counselor	0.113	0.249	0.345	-0.017	0.049	0.069
	(0.105)	(0.368)	(0.436)	(0.067)	(0.149)	(0.191)
Students per counselor × N Admin.	0.036	0.049	0.042	0.074***	0.092**	0.096**
	(0.024)	(0.039)	(0.039)	(0.022)	(0.043)	(0.048)
Panel C: Number of students transferred to another school for disciplinary reasons						
Students per counselor	0.022***	0.062	0.029	0.012*	0.020	0.033
	(0.008)	(0.042)	(0.034)	(0.006)	(0.013)	(0.021)
Students per counselor × N Admin.	0.002	0.003	0.004	0.008***	0.009***	0.008**
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Panel D: Number of students received an expulsion						
Students per counselor	0.024**	0.061	0.077	0.012	0.007	0.005
	(0.010)	(0.046)	(0.058)	(0.008)	(0.014)	(0.018)
Students per counselor × N Admin.	-0.000	0.001	-0.001	0.007***	0.010***	0.008**
	(0.003)	(0.003)	(0.005)	(0.002)	(0.003)	(0.004)
Observations	5,058	3,137	1,606	5,650	3,345	1,653

Notes: Models estimated by 2SLS. The student-to-counselor ratio function (f_{sj}) and its interaction with the heterogeneity variable instrument for the students per counselor and for its interaction with the heterogeneity variable. Covariates included a quadratic polynomial of total enrollment, the heterogeneity variable, an indicator for schools in states with ratio mandates, an indicator for schools in states with ratio recommendations, an indicator for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

APPENDIX

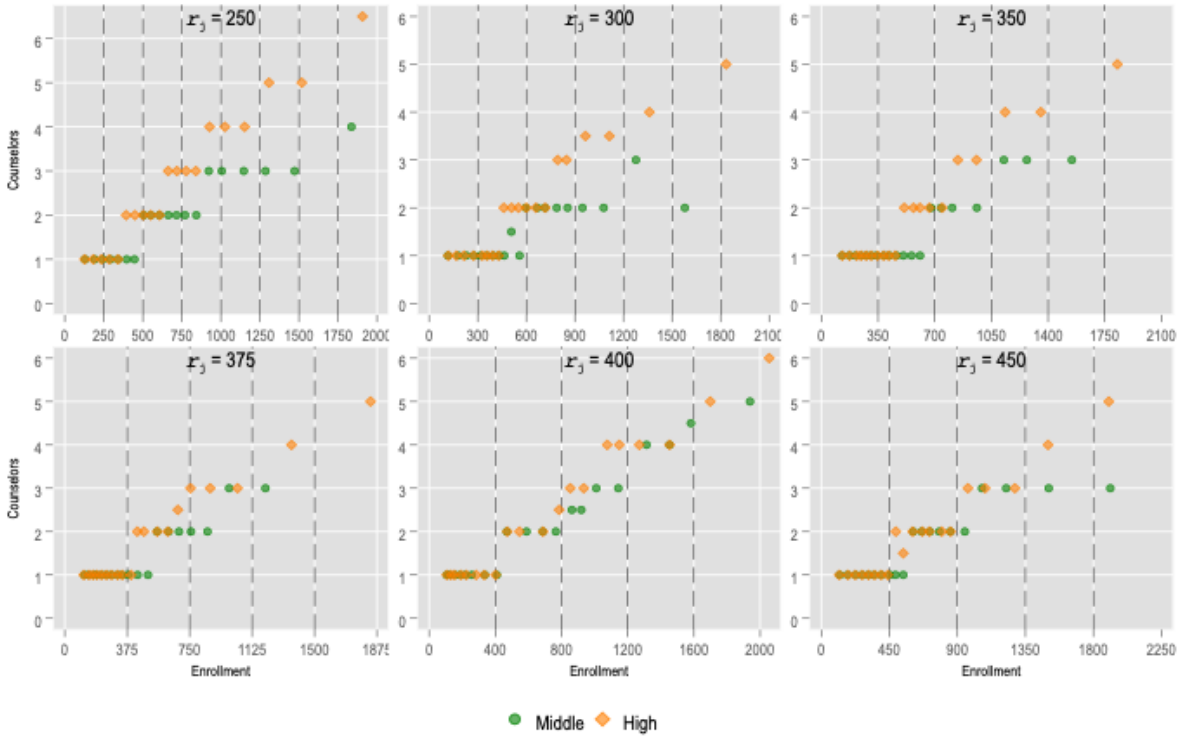
Figures

Figure A.1: Discontinuity and Change in Slope
Enrollment and Students per Counselor



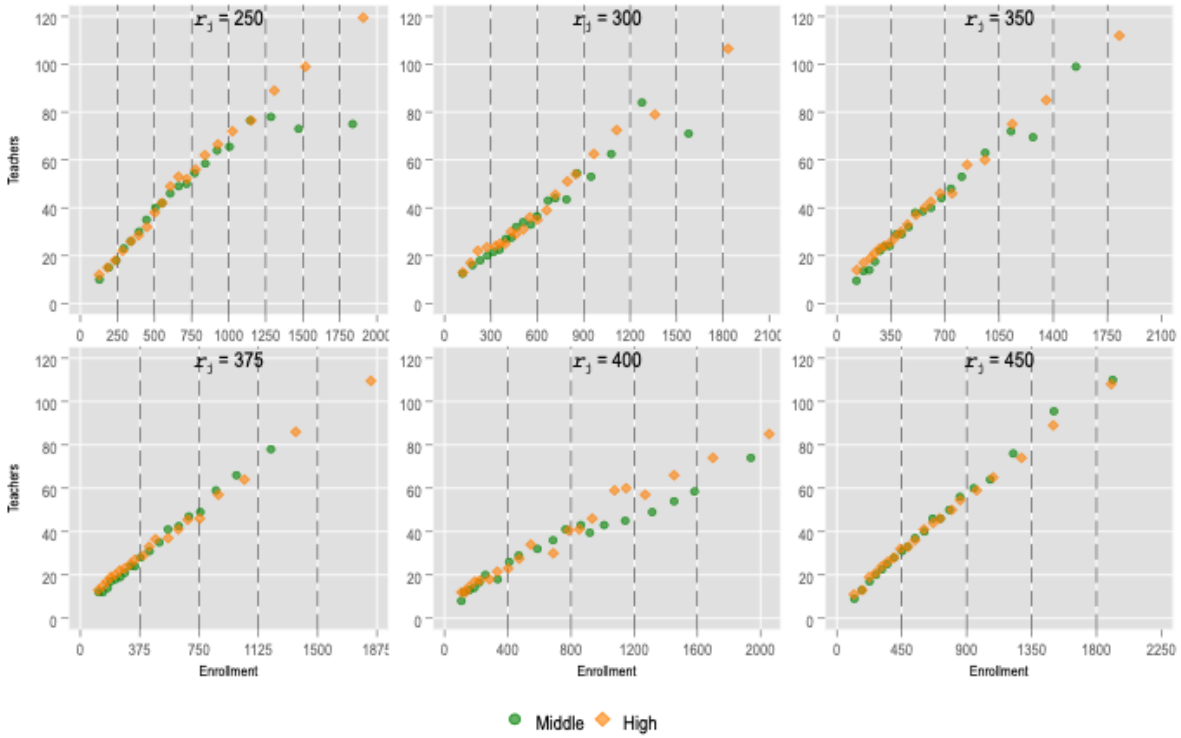
Notes: Optimal data-driven regression discontinuity plot by Calonico et al. (2015). Covariates included are an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Each school enrollment was centered around its closer discontinuity cutoff determined by r_j. Included the first number of discontinuities until covering 85% of schools distribution by r_j. Schools with at least one counselor and enrollment between -/+ 50 students around the corresponding cutoffs. Juvenile justice facilities, special education schools, and alternative schools were excluded. ($N = 1,232$).

Figure A.2: Enrollment and Number of Counselors by r_j



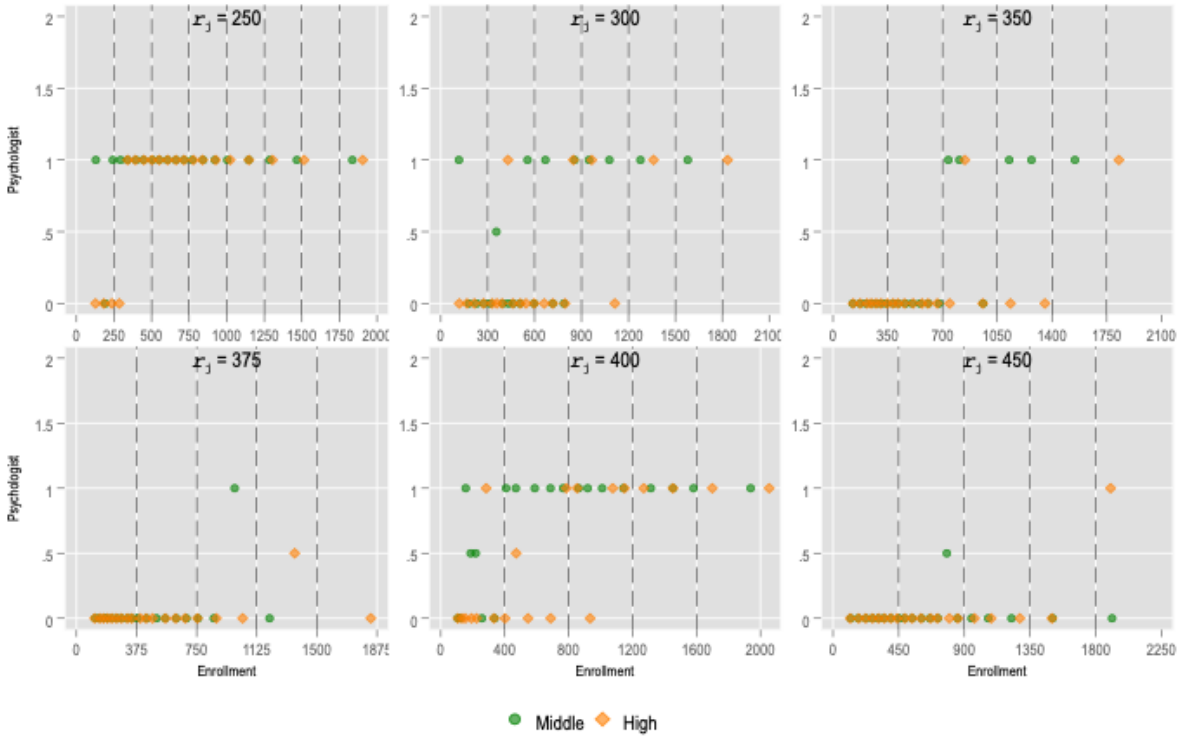
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure A.3: Enrollment and Number of Teachers by r_j



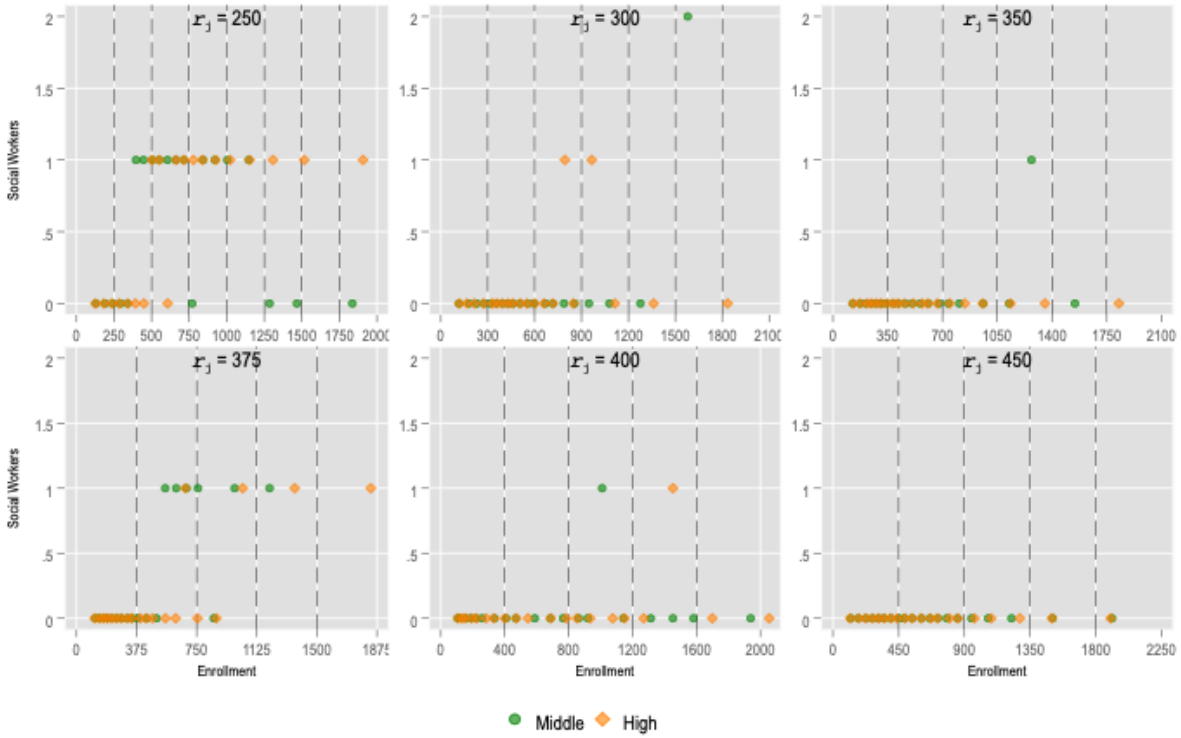
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure A.4: Enrollment and Number of Psychologists by r_j



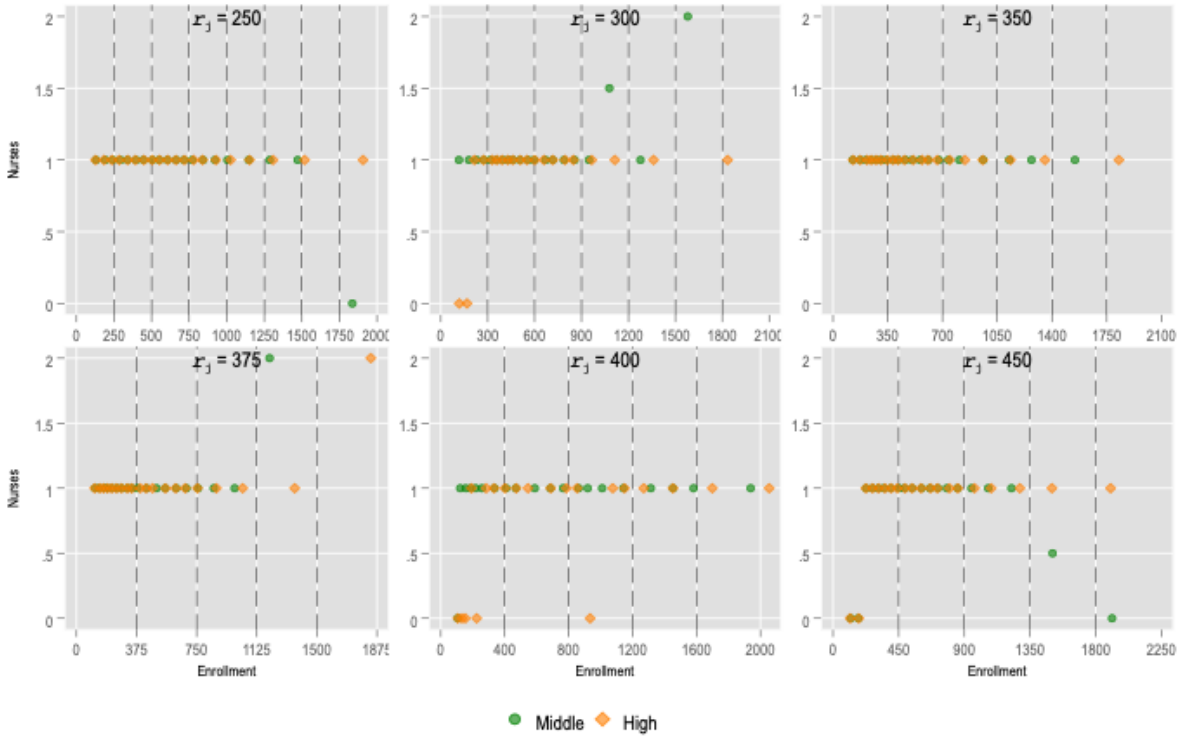
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure A.5: Enrollment and Number of Social Workers by r_j



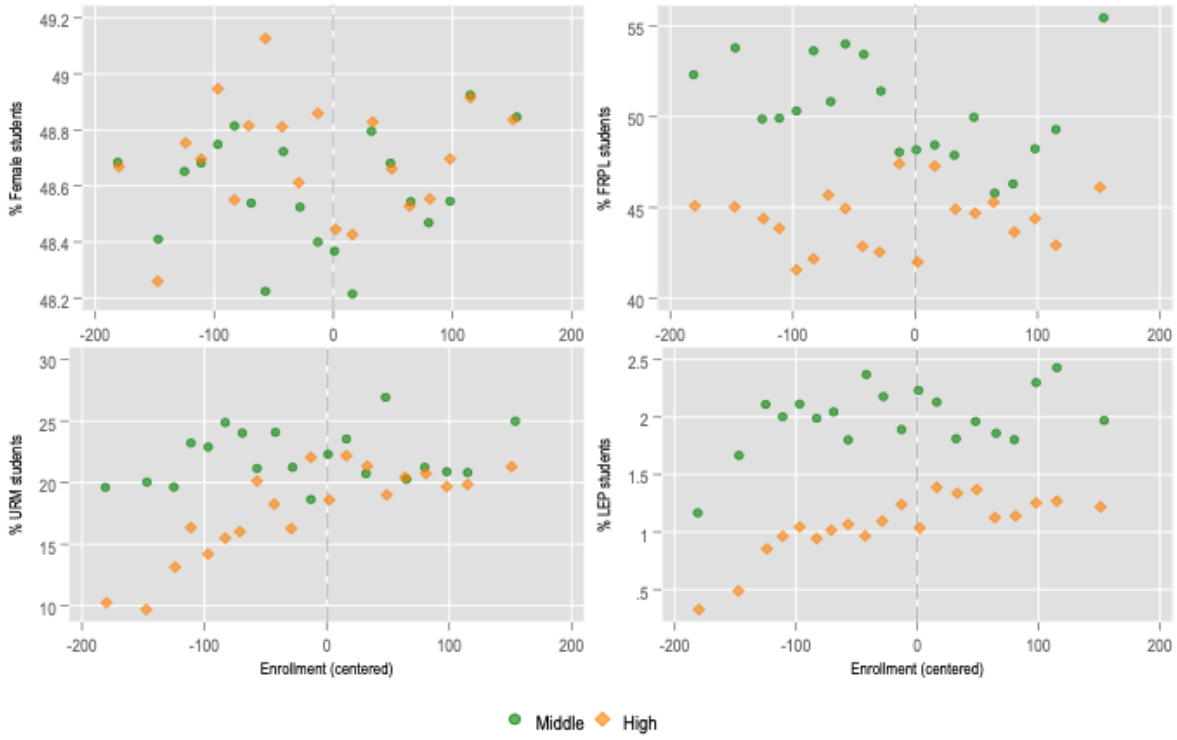
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure A.6: Enrollment and Number of Nurses by r_j



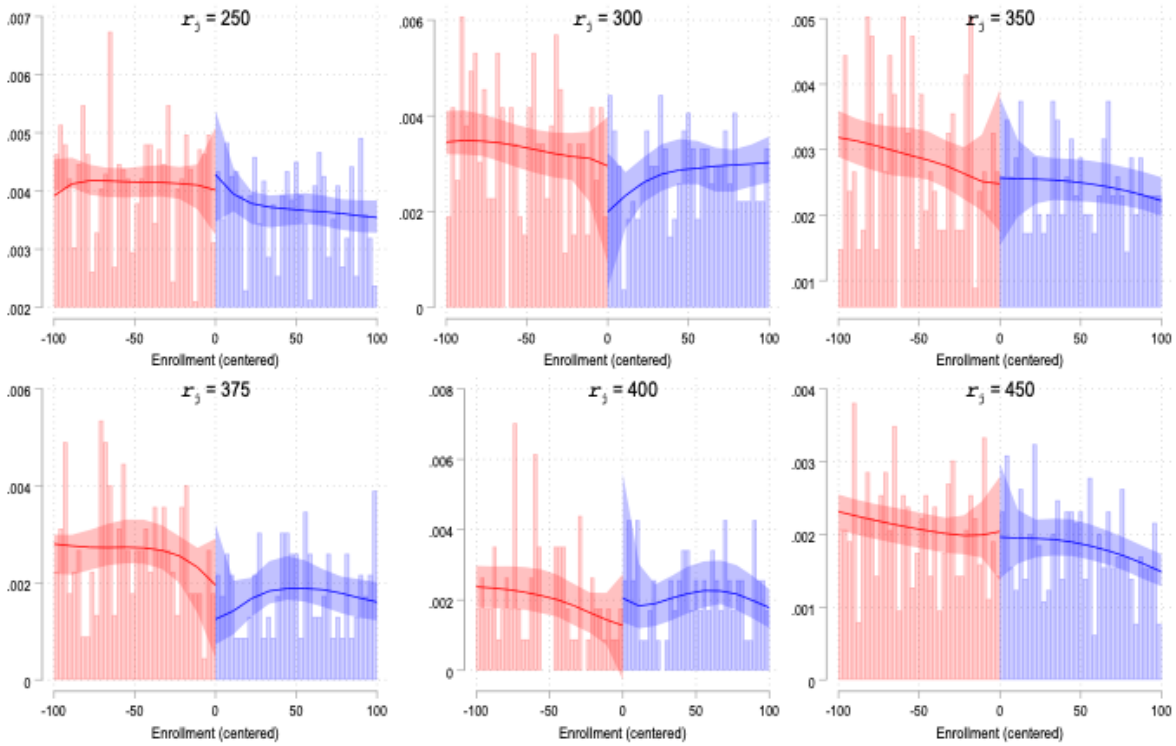
Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results.
$r_j = 250$: Middle and high schools in ID, ME (high), MD, NC, NJ, NM, NV, OR, RI, WI, WV, and WY. ($N = 4,275$).
$r_j = 300$: Middle and high schools in IN, ND, NH, and VT. ($N = 948$).
$r_j = 350$: Middle and high schools in IA, ME (middle), and TN. ($N = 1,216$).
$r_j = 375$: Middle and high schools in MO. ($N = 808$).
$r_j = 400$: Middle and high schools in MT, and UT. ($N = 410$).
$r_j = 450$: Middle and high schools in AR, GA, LA, and OK. ($N = 2,269$).

Figure A.7: Enrollment and Student Body Composition



Notes: Observed cross-medians using analytical sample. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. $N = 10,742$.

Figure A.8: Manipulation tests by r_j



Notes: Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. For presentation purposes, AL and NE are excluded, as these states do not belong to any specific r_j group, and their plots do not vary these results. $N = 9,926$.

Tables

Table A.1: School Staff Continuity Test

	Middle	**High**
Number of Teachers	-0.302	0.236
	(1.819)	(3.627)
Number of Psychologists	-0.028	0.028
	(0.064)	(0.078)
Number of Social Workers	0.094	-0.097
	(0.089)	(0.081)
Number of Nurses	0.155	-0.042
	(0.103)	(0.064)
Observations	5,066	5,644

Notes: Local polynomial regression discontinuity estimation by Calonico et al. (2017) with triangular kernel. Running variable centered to nearest cutoffs. Covariates included are an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors by heteroskedasticity-robust nearest neighbor variance estimator in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table A.2: Student Body Composition Continuity Test

	Middle	**High**
Perc. Female Students	-0.214	-0.048
	(0.320)	(0.539)
Perc. FRPL Students	0.091	0.033
	(2.196)	(2.024)
Perc. URM Students	0.410	-1.530
	(2.412)	(2.434)
Perc. LEP Students	-0.343	0.389
	(0.680)	(0.508)
Observations	5,066	5,644

Notes: Local polynomial regression discontinuity estimation by Calonico et al. (2017) with triangular kernel. Running variable centered to nearest cutoffs. Covariates included are an indicator variable for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students (excluded when used as a dependent variable). Schools in states with a mandate for counseling services, with at least one counselor and enrollment between 100 and 2,350 students. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors by heteroskedasticity-robust nearest neighbor variance estimator in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table A.3: Reduced Form Estimates - Middle Schools

	N Students with Disciplinary Measures	N Students With In- and Out-of-School Suspensions	N Students Transferred to Another School for Disciplinary Reasons	N of Students Who Received an Expulsion	N of Students Who Received a School-Related Arrest
	(1)	(2)	(3)	(4)	(5)
f_{sj}	0.058*	0.042	0.007***	0.007*	0.002
	(0.032)	(0.031)	(0.003)	(0.004)	(0.001)
Dep. Var. Mean	121.6	116.6	1.554	2.564	0.912
Adj. R-squared	0.468	0.467	0.102	0.064	0.017
Observations	3,141	3,141	3,141	3,141	3,141

Notes: Covariates included are a quadratic polynomial of total enrollment, indicator variables for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. Middle schools in states with a mandate for counseling services, with at least one counselor, enrollment between 100 and 2,350 students, and enrollment between $-/+100$ students around the corresponding cutoffs. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A.4: Reduced Form Estimates - High Schools

	N Students with Disciplinary Measures	N Students With In- and Out-of-School Suspensions	N Students Transferred to Another School for Disciplinary Reasons	N of Students Who Received an Expulsion	N of Students Who Received a School-Related Arrest
	(1)	(2)	(3)	(4)	(5)
f_{sj}	0.179***	0.141***	0.020***	0.016***	0.003*
	(0.037)	(0.035)	(0.004)	(0.004)	(0.001)
Dep. Var. Mean	146.7	138.0	2.381	4.437	1.872
Adj. R-squared	0.478	0.474	0.108	0.108	0.063
Observations	3,361	3,361	3,361	3,361	3,361

Notes: Covariates included are a quadratic polynomial of total enrollment, indicator variables for schools in states with ratio mandates, an indicator variable for schools in states with ratio recommendations, an indicator variable for charter schools, the proportion of female students, the proportion of FRPL students, the proportion of URM students, and the proportion of LEP students. High schools in states with a mandate for counseling services, with at least one counselor, enrollment between 100 and 2,350 students, and enrollment between $-/+100$ students around the corresponding cutoffs. Juvenile justice facilities, special education schools, and alternative schools were excluded. Standard errors clustered at the school district level in parentheses. *** p<0.01, ** p<0.05, * p<0.10.