Peer Suspension Effects on Student Misbehavior *

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December 2025

Abstract

School suspensions are a widely debated disciplinary tool, yet evidence on their effectiveness remains mixed. While most discussion focuses on the suspended students themselves, suspensions may also generate spillover effects on peers' behavior. This paper uses administrative data from North Carolina public schools, including detailed disciplinary records, to estimate the impact of peers' misbehavior and suspensions on a student's subsequent misbehavior. We construct peer networks based on shared disciplinary infractions in prior periods and estimate a fixed effects model that exploits temporal variation in peers' infractions to identify the causal effects of peer misbehavior and suspensions on future student behavior. We find that exposure to peer misbehavior not resulting in suspension increases a student's propensity of misbehaving in the subsequent two-week period by 8–9 percent, and that peer suspensions do not mitigate this effect, indicating no evidence of a deterrent effect of peer suspensions.

Keywords: peer effects, suspension, deterrence
JEL Codes: I20, I21

*We are grateful to Francesco Agostinelli, Petra Todd, and conference/seminar participants at Southern Economic Association, the University of Pennsylvania, and Syracuse University for their feedback on this paper. This research was approved by Syracuse University IRB and the University of Pennsylvania IRB.

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1 Introduction

The use of school suspensions as a disciplinary measure is a widespread practice, with more than 2.5 million public school students in the U.S. receiving suspensions each year, amounting to approximately 5 percent of students (NCES, 2018). Schools primarily use suspensions as a disciplinary measure to prevent future misbehavior and to maintain a suitable learning environment for other students (Perera & Diliberti, 2023). However, in recent years, the use of school suspensions has become increasingly controversial in policy discourse.

Arguments against suspensions focus on the adverse effects on the individual receiving a suspension, including negative educational outcomes such as lower test scores and graduation rates, worse labor market outcomes, and higher incarceration rates (Bacher-Hicks, Billings, & Deming, 2019; Sorensen, Bushway, & Gifford, 2022). On the other hand, an argument for the use of suspensions is that removing disruptive students from the classroom may have positive spillover effects on other students, given the large body of work establishing the importance of peer effects.[1] Research has found some evidence that student suspensions lead to improvements in test scores of classmates due to reduced disruptions in the learning environment (Hwang & Domina, 2021). Another potential peer mechanism is that student suspensions may have a positive behavioral spillover if they discourage peers from misbehaving, although there is not much empirical evidence on this pathway.

This paper studies peer effects in school misbehavior and the consequences of student suspensions. First, we quantify peer effects in school misbehavior, asking to what extent exposure to peers' prior misbehavior affects a student's own likelihood of engaging in disciplinary infractions. Second, we analyze whether student suspensions influence subsequent misbehavior among peers, assessing whether suspensions serve as a disciplinary deterrent or, alternatively, generate spillover effects on peer behavior. We use administrative data on public school students in North Carolina, focusing on students entering middle school in 2016. The data contain rich information on students' disciplinary records, including the date of each infraction, the nature of the infraction, the punishment received, and information on each student involved in the incident. These data allow us to identify each student's *disciplinary peers*, defined as the set of students with whom the student has previously been jointly involved in a disciplinary incident. This peer group is of particular interest because its members are both more likely to engage in misbehavior and more plausibly positioned to influence one another's behavior.

[1] See Sacerdote (2011) and Cools and Patacchini (2021) for a review of research on peer effects.

Importantly, disciplinary peers are known to have had direct behavioral interactions, in contrast to alternative peer definitions based on shared physical environments—such as classrooms or grade cohorts—that do not necessarily reflect meaningful social interaction.

We estimate whether peer disciplinary infractions in prior weeks increase the probability of a student's own propensity to get involved in a disciplinary infraction in the current week. Specifically, to assess whether suspensions are an effective means of influencing the behavior of others, we examine whether peer disciplinary infractions that result in a suspension (suspension incidents) have a different effect on student behavior compared to otherwise similar peer infractions that do not result in a suspension (non-suspension incidents).

Intuitively, our empirical strategy compares a student in periods when they recently had peers either misbehave or be suspended to the same students in periods when his peers did not.[2] We examine whether exposure to peer suspensions affects a student's own likelihood of misbehavior or suspension in the near future. The key idea is that if peer misbehavior (resp. suspension) induces (resp. deters) bad behavior, then students should become more (less) likely to misbehave themselves following periods with peer incidents (suspensions), relative to periods without. Our empirical design controls for many potential confounders that could otherwise bias this comparison. Specifically, we account for students' own baseline tendencies to misbehave, their evolving disciplinary history, and demographic characteristics of both students and peers. We also include detailed fixed effects to absorb time-varying shocks that are common to students in the same school or grade (e.g., changes in discipline policy, substitute teachers, or weather). Our key identifying assumption is that, after controlling for these factors, there are no remaining unobserved variables that simultaneously affect both a student's likelihood of misbehaving and their peers' likelihood of being suspended. Furthermore, to identify the effect of peer suspension, relative to peer non-suspension incidents, we restrict comparisons between suspension and non-suspension incidents to those of similar severity. Intuitively, students may react differently to peer incidents that are highly serious or disruptive than to those that are relatively minor, regardless of the disciplinary consequence. To ensure comparability, we first separate peer suspension incidents into those resulting in short suspensions and those resulting in long suspensions, under the assumption that incidents leading to short suspensions are more similar in severity to incidents that do not result in suspension. We then further distinguish between in-school suspensions (ISS) and out-of-school suspensions (OSS), recognizing that OSS is typically assigned for more serious offenses than ISS.

[2] In our preferred specification, a period represents a two-week window.

Results indicate that a peer receiving a suspension in the two time periods leading up to the current time period increases the propensity for a student to misbehave in the current period. Specifically, for a student with one peer, an increase in one suspension incident by the peer in the prior two-week period increases the likelihood that a student will have an infraction by 8.6 percent relative to the mean in the current period and increases the number of infractions the student gets involved in by 15.6 percent. In contrast, non-suspension peer incidents have a much more muted effect on a student's own propensity to misbehave. Neither peer suspension nor non-suspension incidents two periods prior influence student behavior in the current period. These findings are suggestive that peer suspensions may have a deterrent effect on student misbehavior. However, as mentioned above, one concern with these aggregate comparisons between peer suspension incidents and non-suspension incidents is that we are comparing incidents that are very different in severity and that these underlying differences in severity may influence how students respond to peers as well.

To address concerns that our results are driven by incident severity, we first distinguish between peer suspensions lasting one day or less and those lasting longer. If severity were the primary driver, more serious incidents—clearly distinct from non-suspendable behavior—would be associated with longer suspensions. In contrast, short suspensions likely arise from incidents closer to the suspension margin and are therefore more comparable to non-suspension incidents. When we restrict comparisons to these more comparable events, we no longer find evidence of a deterrent spillover effect. Both non-suspension peer incidents and short suspension peer incidents increase subsequent misbehavior by 8–9 percent and raise the number of incidents by 13–15 percent. Moreover, short peer suspensions two periods earlier also increase current misbehavior, whereas non-suspension peer incidents do not.

We further refine the comparison by distinguishing between in-school suspensions (ISS) and out-of-school suspensions (OSS), recognizing that OSS typically reflect more severe offenses. Consistent with the duration-based results, we find no meaningful differences between the effects of non-suspension incidents and short ISS peer suspensions, reinforcing the conclusion that suspensions do not deter peer misbehavior.

Additionally, we perform several robustness checks to test the validity of our findings. First, we conduct a falsification test in which we randomly assign students to placebo peers, with peers consisting of students in the same school. This test assesses whether our empirical strategy captures true peer effects rather than spurious correlations. If our identification assumptions hold, placebo peers should have no impact on the student's own behavior. Second, we assess whether our findings are robust to the exclusion of

peers who were formed through fights or the use of aggressive behavior. These are common types of infractions in the data, but they often reflect a more antagonistic rather than friendly relationship, and it is not clear that peers formed through these incidents have the same type of influence on each other. Finally, we add controls for an additional time period to our primary specification to address the possibility of a persistence effect. Reassuringly, our findings are robust to the checks mentioned above.

This study builds on multiple areas of research. First, this paper relates to research investigating peer effects in student misbehavior. Several studies have established the importance of peers on students' outcomes (Cools & Patacchini, 2021; Sacerdote, 2011). In addition to effects of peers on academic outcomes, a growing body of work documents the effects of peers on disciplinary issues as well. Figlio (2007) and Carrell and Hoekstra (2010) find evidence that exposure to disruptive increases behavioral problems at school, in addition to decreasing test scores. Carrell, Hoekstra, and Kuka (2018) find that exposure to disruptive peers leads to long-run decreases in earnings as well. Using data on Hurricanes Katrina and Rita evacuees, Imberman, Kugler, and Sacerdote (2012) find that an increase in exposure to hurricane evacuee peers increased absenteeism and disciplinary incidents for students in Houston schools, particularly for Black and female students. Bennett and Bergman (2021) find evidence of students systematically coordinating absences to skip school together, and Lenard and Silliman (2025) find that exposure to peers with more intensive disciplinary infraction records increases a student's own disciplinary infractions. Carrell, Malmstrom, and West (2008) find that higher levels of peer cheating in college classrooms increases the likelihood that an individual will cheat. Finally, Billings, Deming, and Ross (2019) find that exposure to at-risk peers increases the propensity for an individual to engage in criminal activity. We contribute to this literature by leveraging a novel approach to constructing peer networks—linking students through shared disciplinary incidents recorded in administrative data. This method captures peers with documented behavioral interactions, rather than relying on classroom or neighborhood co-membership. To our knowledge, only Bennett and Bergman (2021) employ a related strategy, reconstructing peer links from overlapping truancy episodes. Our estimates also provide evidence of peer effects operating over short time horizons: peer misbehavior increases a student's likelihood of misbehaving within the subsequent two weeks. This offers complementary evidence to studies that examine peer effects over longer intervals, such as an academic year.

Second, this study relates to research assessing the effects of exclusionary disciplinary policies in K-12 education. Prior research has found that exposure to harsher discipline policies have negative effects on academic outcomes, as well as longer-term outcomes

like college attendance and adult incarceration (Bacher-Hicks et al., 2019; Sorensen et al., 2022). These findings are especially troubling given that several studies have found evidence of racial disparities in the use of exclusionary discipline policies (Barrett, McEachin, Mills, & Valant, 2021; Kinsler, 2011; Liu, Hayes, & Gershenson, 2022; Shi & Zhu, 2022). However, some papers also find positive effects to exclusionary discipline. Kinsler (2013) finds that school discipline has a positive overall effect on student performance, as measured by standardized test scores. Pope and Zuo (2023) find that reducing school suspensions decreases test scores and increases absences, although it also increases teacher turnover. Hwang and Domina (2021) finds that student suspensions have positive effects on math achievement and no effect on reading achievement for classmates of the suspended student. This paper contributes to existing research in assessing whether exclusionary discipline has spillover effects on the behaviors of a student's peers. This is an especially relevant question given that one argument that has been made for strict exclusionary discipline policies is to deter other students from engaging in disruptive behavior (Ewing, 2000).

In the remainder of the paper, Section 2 describes the data used in this study and explains how peers are defined. Section 3 outlines the empirical strategy, and Section 4 presents analysis results and robustness checks. Section 5 concludes.

2 Data and Peer Defintion

This project uses data from the North Carolina Education Research Data Center (NCERDC). For all public schools in North Carolina, the data show administrative records of student demographics and academic outcomes. In addition, for the school years from Fall 2008 to Spring 2019, the data also contain records of all disciplinary infractions that received office referrals for students attending primary and secondary public schools. These infractions may or may not have resulted in a suspension or some other kind of punishment (e.g., detention). For each incident, the record contains a unique incident identifier, the date of the incident, and a description of the type of infraction. It also identifies all students involved in the incident. For each student involved in an incident, the record shows whether the student received a suspension for the incident and if so, the type (in-school or out-of-school) and the length (in days) of the suspension received.[3] Importantly, the

[3]If no suspension is given, principals may employ other disciplinary actions such as after-school detention, lunch detention, and/or verbal and written warnings. Our analysis focuses on student suspensions, as suspensions account for a majority of school disciplinary measures. As illustrated in Appendix Table A1, approximately 70% of incidents result in a suspension of any length, while only 5% of incidents receive

data allow to track a student's disciplinary record over time and to identify all the students with whom they misbehave at school. In this section, we describe how we construct peer networks based on shared disciplinary behavior, and present the sample used in the empirical analysis. To keep the sample size manageable, we focus the analysis on one cohort throughout its middle school years —specifically, the cohort entering sixth grade in 2016.[4]

2.1 Peer Networks

Following Bennett and Bergman (2021), we construct peer networks based on shared disciplinary behavior. Specifically, a student's set of peers at school s in period t includes all other students at the school with whom they have shared any disciplinary infraction from the start of sixth grade (or from when they first enrolled at the school, if later) up to the end of the previous period ($t-1$). To ensure meaningful peer relationships, we exclude infractions involving more than ten students, as such interactions are unlikely to reflect significant social ties. Once two students become peers, they remain so until either student leaves school s.[5]

This peer definition offers several advantages over the classroom-based or cohort-based groupings commonly used in the literature. First, it captures students with established connections, even if they do not or no longer share a class or grade. Second, shared disciplinary infractions indicate direct interaction between students, while merely sharing a class may involve minimal contact, particularly if students do not sit near each other.[6] Students do not typically spend the whole day with the same class or set of students in North Carolina middle schools, so peer groups defined from course membership

after-school or lunch detention. Students being expelled or placed in an Alternative Learning Program, which is typically an off-campus alternative school, is not common.

[4]This is the most recent cohort for which disciplinary records are available throughout middle school in the NCERDC data. We restrict our analysis to one cohort of students due to computational intensity.

[5]As a robustness check, we also consider a version in which peer networks reset at the end of each academic year. In that version, a student's set of peers at school s in period t includes all other students at the school with whom they have shared any disciplinary infraction from the start of the academic year (or from when they first enrolled at the school, if later) up to the end of the previous period ($t-1$). Once two students become peers, they remain so until the end of the academic year (or when a student leaves school s, if earlier). Results with this specification a very similar to those presented in Section 4 and are available upon request.

[6]Research on friendship networks has found a positive link between classroom seat proximity and friendship strength, though our data only link students at the classroom level (Faur & Laursen, 2022; Rohrer, Keller, & Elwert, 2021; van den Berg & Cillessen, 2015; White, 2013).

are artificially very large, in addition to not capturing direct interactions. These definitive disciplinary networks also eliminate the biases inherent in self-reported friendship networks, providing a more precise measure of peer interactions. Third, peer networks defined by shared infractions are intuitively more relevant to the study of misbehavior than classroom networks, which may be better suited to academic outcomes (Burke & Sass, 2013; Imberman et al., 2012; Lavy & Schlosser, 2011) and friendship (Faur & Laursen, 2022; Rohrer et al., 2021; van den Berg & Cillessen, 2015; White, 2013). In addition, infractions are recorded at the student-date level, without information on which class the infraction took place. Using peer groups based on shared disciplinary behavior reduces the risk of conflating misbehavior not seen with peer interactions. For example, consider students 1 and 2 who share Mathematics class but not English class. If student 1 is involved in an infraction during English, counting this as a peer infraction for student 2 would inaccurately attribute exposure to misbehavior. Such errors could underestimate the true peer effects. Finally, defining peers through infractions also allows us to capture the intensity of peer interactions. Multiple joint infractions likely reflect intentional and sustained interaction compared to merely sharing classes.

2.2 Sample description

In the cohort entering sixth grade in 2016, we restrict our attention to *at-risk* students, that is, students with at least one infraction in during their middle-school years.[7] Our final sample contains 39,112 students.[8] Table 1 shows descriptive statistics about the students in sample. Table 2 describes the infractions these students are involved in. The majority of students involved in disciplinary infractions are male. Among students who have ever committed an infraction, Black and economically disadvantaged students are more likely to be involved in infractions with peers. On average, students who have ever been involved an infraction are involved in 1.76 incidents per year, 1.23 of which result in suspension, and 0.23 (13%) of which are joint infractions involving peers. About 5% of these

[7] On average every year, about 18% of all middle school students in NC are involved in at least one disciplinary infraction, and 15 percent receive a suspension (Figure A1 in appendix). We compare demographics of students that never commit an infraction to those in at least one infraction during an academic year in Table A3.

[8] We exclude from the sample students with any suspension longer than eight weeks. They represent a negligible share of the population as 99.8% of suspensions last ten or fewer days in the middle school population. Figure A2 in appendix displays frequencies of suspension length for all students in the full sample (top panel) and in the analytic sample (bottom panel). Most suspensions are short in nature, with suspensions three days or less accounting for approximately 90% and 86% of all suspensions in the middle school population and analytic sample, respectively.

students have at least one peer with whom they have shared an infraction. Those with peers tend to be involved in infractions more frequently, averaging 4.87 infractions per year, including 3.30 that lead to suspension. They also have an average of 4.01 peers, and approximately 37% of their infractions are committed jointly with others. Overall, 70% of infractions result in a suspension, with suspensions lasting an average of 2.4 days, and 57% of infractions being served in school, rather than out of school. Infractions involving a single student are slightly less likely to lead to suspension compared to those involving multiple students (69% vs. 75%), and the resulting suspensions are also slightly shorter on average (2.35 days vs. 2.54 days).

3 Empirical Strategy

We estimate the following equation to assess the effects of peer suspension incidents and non-suspension incidents on an student's propensity to engage in school misbehavior:

$$\begin{aligned} y_{it} = {} & \mathbf{w}^I_{it-1}\phi_1' + \mathbf{w}^S_{it-1}\phi_2' + \mathbf{j}^I_{it-1}\phi_3' + \mathbf{j}^S_{it-1}\phi_4' + \mathbf{k}^I_{it-1}\alpha_1' + \mathbf{k}^S_{it-1}\alpha_2' \\ & + \mathbf{x}_{it}\gamma_1' + \mathbf{z}_{it}\gamma_2' + \theta_i + \xi_{gs} + \zeta_{st} + u_{it} \end{aligned} \tag{1}$$

We omit grade, school, and year subscripts in y_{it} for readability. The outcome variable, y_{it}, is a measure of student i's misbehavior in period t. We use two primary measures: a binary indicator for whether during period t student i was involved in any disciplinary infractions and a count variable that records the number of disciplinary infractions committed by student i in period t. On the right-hand side, the vectors $\mathbf{w}^I_{it-1} = (w^I_{it-1}, \ldots, w^I_{it-\tau})$, $\mathbf{w}^S_{it-1} = (w^S_{it-1}, \ldots, w^S_{it-\tau})$, $\mathbf{j}^I_{it-1} = (j^I_{it-1}, \ldots, j^I_{it-\tau})$ and $\mathbf{j}^S_{it-1} = (j^S_{it-1}, \ldots, j^S_{it-\tau})$ for $\tau \geqslant 1$ capture the recent disciplinary record of student i's peers in the τ periods leading up to period t. Because we want to disentangle the effects of one's peers being involved in infractions from the effects of one's peers receiving a suspension, we distinguish infractions into two categories: *suspension incidents*, which led to a suspension (in variables with the S superscript), from *non-suspension incidents*, which did not lead to a suspension (in variables with the I superscript). To ensure that the peer effects of interest are not confounded by the effect of i's own recent past behavior on her current behavior, we distinguish between disciplinary infractions that *jointly* involved student i and some of her peers (recorded in $\mathbf{j}^I$ and $\mathbf{j}^S$) from and incidents of interest that involved i's peers but not i herself (recorded in $\mathbf{w}^I$ and $\mathbf{w}^S$). Our parameters of interest are ϕ_1 and ϕ_2. They capture the effect of a student's peers' record of non-suspension incidents and suspension incidents in the periods leading up to period t on a student's own disciplinary outcomes in period t. In the identification paragraph below, we discuss further the interpretation

Table 1: Mean Characteristics of Students in Infractions

	(1) Analytic Sample	(2) Analytic Sample Students with Peers
Demographics		
Female	0.35	0.32
White	0.40	0.20
Black	0.39	0.60
Asian	0.01	0.01
Hispanic	0.16	0.16
Other Race	0.04	0.03
Economically Disadvantaged	0.66	0.81
Misbehavior and Peers		
Avg. infractions per year	1.76	4.87
	(2.43)	(4.15)
Avg. suspensions per year	1.23	3.30
	(1.75)	(2.92)
Avg. in-school susp. (ISS) per year	0.69	1.78
	(1.07)	(1.78)
Avg. out-of-school susp. (OSS) per year	0.53	1.52
	(0.99)	(1.76)
Avg. joint infractions per year	0.29	1.78
	(0.57)	(1.24)
Avg. susp. from joint infrac. per year	0.21	1.19
	(0.44)	(0.98)
Has at least one peer	0.05	1.00
	(0.21)	(0.00)
Avg. number of peers	0.70	4.01
	(1.50)	(3.44)
Obs.	39,112	1,798

Column (1) shows statistics about the analytical sample, that is, students with at least one infraction between Fall 2016 and Spring 2018. The sample is further restricted in Column (2) to those students with at least one *joint* infraction between Fall 2016 and Spring 2018, and therefore at least one peer. Standard deviations of variables shown in parentheses.

Table 2: Mean Characteristics of Infractions Committed by Students in Analytic Sample

	Analytic Sample	Analytic Sample Solo Infractions	Analytic Sample Joint Infractions
Share Leading to Suspension	0.70	0.69	0.73
	(0.46)	(0.46)	(0.44)
Suspension Length (in days)	2.31	2.28	2.58
	(4.09)	(4.22)	(2.57)
ISS Length (in days)	0.96	0.98	0.74
	(3.38)	(3.54)	(1.10)
OSS Length (in days)	1.36	1.30	1.84
	(2.80)	(2.80)	(2.82)
Share of Joint Infractions	0.09	0.00	1.00
	(0.29)	(0.00)	(0.00)
Students per Infraction	1.15	1.00	2.55
	(0.62)	(0.00)	(1.39)
Obs.	182,195	165,098	17,097

Column (1) describes infractions committed during the 2016-2018 academic years by students in our analytical sample (and their joint offenders), that is, entering 6th grade in 2016 who were involved in at least one infraction during the 2016-2018 academic years. In Column (2), the sample of infractions is restricted to those committed by one student only, while Column (3) describes joint infractions, which involve at least two students. Standard deviations of variables shown in parentheses.

of these parameters and the conditions for their causal identification. In the next paragraph, we provide details on the construction of the vectors $\mathbf{w}^I_{it-1}$, $\mathbf{w}^S_{it-1}$, $\mathbf{j}^I_{it-1}$ and $\mathbf{j}^S_{it-1}$. The vectors $\mathbf{k}^S_{it-1} = (k^S_{it-1}, \ldots, k^S_{it-\tau})$ and $\mathbf{k}^I_{it-1} = (k^I_{it-1}, \ldots, k^I_{it-\tau})$ record the recent history of i's solo infractions in the periods leading up to period t, again distinguishing between infractions that did and did not lead to a suspension.[9] $\mathbf{x}_{it}$ and $\mathbf{z}_{it}$ are vectors of individual characteristics for i and her peers, respectively. The vector of controls $\mathbf{x}_{it}$ includes the student's cumulative number of non-suspension and suspension incidents in the current academic year through $t-\tau-1$, the student's total number of non-suspension and suspension incidents in the previous academic year, and time-varying individual characteristics, such as economic disadvantage status. The vector of controls $\mathbf{z}_{it}$ includes the student's cumulative peer count through $t-1$, the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers in the current academic year

[9]Together, $\mathbf{k}^S_{it-1}$, $\mathbf{k}^I_{it-1}$, $\mathbf{j}^I_{it-1}$, and $\mathbf{j}^S_{it-1}$ capture all the infractions involving i the recent periods leading up to period t, with the $\mathbf{k}$ vectors recording solo infractions, and $\mathbf{j}$ vectors accounting for joint infractions.

through $t-\tau-1$, and their total weighted number of non-suspension and suspension incidents in the previous academic year, as well as (weighted) peer demographics, such as sex, economic disadvantage status, and ethnicity). Finally, θ_i, ξ_{gs}, and ζ_{st} are individual, school-grade, and school-by-period fixed effects, respectively.

Vectors of disciplinary records. The recent disciplinary records of student i's peers in the periods leading up to t are weighted by the total cumulative number of shared joint incidents between i and each of his peers. Formally, $\mathbf{w}^I_{it-1} = (w^I_{it-1}, \ldots, w^I_{it-\tau}), \tau > 0$ where $w^I_{it-\tau}$ is a weighted count of non-suspension incidents student i's peers were involved in during period $t-\tau$. In our preferred specification, the vectors of recent disciplinary records include two lagged periods leading up to period t, that is, periods $t-1$ and $t-2$. Robustness checks show that similar results holds when including three lagged periods. Specifically, for any period τ:

$$w^I_{i\tau} = \sum_{\ell \in \mathcal{P}_{i\tau}} \omega_{\ell,i\tau} e^I_{\ell\tau}, \tag{2}$$

where $\mathcal{P}_{i\tau}$ is student i's peer group at period τ, $e^I_{\ell\tau}$ is the number of non-suspension incidents student ℓ was involved in during period τ and that did not involve student i, and $\omega_{\ell,i\tau}$ is the weight of ℓ among i's peers at date τ. We use weights that reflect the *relative* intensity of the tie between i and each of her peers—the weight assigned to peer ℓ in period t is equal to the share of the joint infractions i was involved in with ℓ among all joint infractions i was involved in with her peers since the beginning of the school year up until period τ.[10] The vector $\mathbf{w}^S_{it-1}$ is constructed similarly but using i's peers' incidents that did result in suspensions, that is, $e^S_{\ell\tau}$ in Equation 2. The vectors $\mathbf{j}^I_{it-1}$ and $\mathbf{j}^S_{it-1}$ are defined analogously but using joint suspensions between i and her peers, while the counts $e^I_{\ell\tau}$ and $e^S_{\ell\tau}$ used to construct $\mathbf{w}^I_{it-1}$ and $\mathbf{w}^S_{it-1}$ exclude peer infractions that also involve i. To construct current peers' cumulative non-suspension and suspension incident counts in $\mathbf{z}_{it}$, we weight peers using the same weights as for the vectors $\mathbf{w}^S_{it-1}$, $\mathbf{w}^I_{it-1}$, $\mathbf{j}^S_{it-1}$ and $\mathbf{j}^I_{it-1}$. The vectors that record i's own recent infraction history are simply constructed as $\mathbf{k}^S_{it-1} = (e^I_{it-1}, \ldots, e^I_{it-k})$ and $\mathbf{k}^I_{it-1} = (e^S_{it-1}, \ldots, e^S_{it-k})$ for $k > 0$.

Identification. To ensure that ϕ_1 and ϕ_2 capture the causal effects of peer non-suspension and suspension incidents, respectively, on the student's behavior, Equation 1 explicitly

[10] While the literature typically uses a linear-in-means model, weighting peers by $\frac{1}{n-1}$, we weight by the quantity of joint infractions to capture the intensity of the tie between two students. For example, if student i shares four infractions with student ℓ and only one infraction with student j, it is likely student ℓ will have a greater influence on student i.

controls for multiple confounding factors.

First, students whose peers tend to misbehave may have a higher baseline propensity to misbehave themselves, regardless of their peers' behavior. Equation 1 therefore includes an individual fixed effect. Equation 1 also controls for the student's time-varying disciplinary record through $\mathbf{k}^I_{it-1}$ and $\mathbf{k}^S_{it-1}$, as well as the vector $\mathbf{x}_{it}$ which includes i's numbers of peers as of period t, and i's cumulative counts of non-suspension incidents and suspension incidents in the school year up until week $t-\tau-1$. The vector $\mathbf{x}_{it}$ also includes measures of individual behavior that vary across years, such as i's number of non-suspension and suspension incidents in the previous school year.

The reflection problem (Manski, 1993) is another standard concern when trying to identify peer effects. Just like peers' past behavior influences i's behavior, i's past behavior influences his peers'. As a consequence, serial correlation in a student's own behavior may confound the identification of the parameters of interest if it is not accounted for. Equation 1 therefore explicitly accounts for students' own disciplinary history over the τ periods leading to period t, as well as their cumulative number of non-suspension incidents and suspension incidents in the current school year prior to that.

In addition, a student and their peers may respond to common external factors that are unobserved to the econometrician. For instance, students in certain schools may have a larger propensity to misbehave or a larger probability to be suspended given an infraction because of different disciplinary policies. Students may also be more likely to misbehave with a temporary substitute teacher, or when the weather is hot. The school-grade and school-period fixed effects in Equation 1 account for these unobserved factors.

Finally, a student's behavior and their peers' may be correlated because of their common individual characteristics. For instance, students in higher grades may be more likely to commit infractions and, at the same time, students tend to be friends with other students in their own grade. To prevent the effect of peers' behavior on a student's from being confounded by such common exogenous attributes, the vector $\mathbf{z}_{it}$ in Equation 1 controls for current peers' individual characteristics (sex, race, ethnicity, and economically disadvantaged status), as well as their cumulative non-suspension and suspension incident counts in the school year up until period $t-\tau-1$, and in the previous year.

Hence, the key assumption for the identification of ϕ_1 and ϕ_2 as the causal effects of a student's peer's misbehavior in the periods leading up to t on the student's own behavior in period t is that, for any given student, there are no unobserved factors that affect both the student's peers' propensity of committing an infraction or getting suspended and the student's own propensity of doing so, controlling for the elements above, including the student's individual probability to misbehave, and for temporal shocks that are common

to all students in a grade and in the school.

Towards the identification of the causal effect of peer suspensions on one's behavior. Through the empirical design in Equation 1, the parameter ϕ_1 captures the causal effect of peer non-suspension incidents in the periods leading to t on a student's behavior in t; and the parameter ϕ_2 captures the causal effect of peer suspension incidents in the periods leading to t on a student's behavior in period t. If, conditional on misbehavior, suspensions were given at random, then comparing ϕ_2 to ϕ_1 would also inform about the causal effect on a student's behavior of peers receiving a suspension, relative to simply engaging in misbehavior. In particular, if $\phi_2 < \phi_1$, this would indicate that peers' suspensions serve as a deterrent for student misbehavior. Suspensions are, however, likely not given at random upon misbehaving, and one potential concern is that incidents punished by a suspension may differ from incidents that did not yield a suspension in ways that are not accounted for in Equation 1. In that case, the difference between ϕ_2 and ϕ_1 would capture not only the effect of the suspension, but also the fact that incidents that do and do not lead to a suspension differ in their effects on peers. To get at the effect of peer suspensions themselves, we use the following two specifications that better control for the nature of infractions.

First, among suspension incidents, we distinguish between those followed by a one-day suspension and those followed by a suspension of two days or more, and we allow the parameter ϕ_2 to take different values for these two groups of peer suspensions. The intuition behind this approach is that infractions that triggered a short suspension are likely to be very similar in nature to the ones that did not yield a suspension. In particular, for infractions of relatively low gravity, whether the offender is punished by a short suspension or no suspension may depend on factors that, conditional on the controls included in Equation 1, would not directly affect the behavior of the offender's peers — e.g., the offender's demeanor in the principal's office or his attitude regarding his actions. Specifically, we consider the following regression:

$$\begin{aligned} y_{it} = {} & \mathbf{w}^{I}_{it-1}\phi_1' + \mathbf{w}^{S_1}_{it-1}\phi_{2(1)}' + \mathbf{w}^{S_2}_{it-1}\phi_{2(2)}' + \mathbf{j}^{I}_{it-1}\phi_3' + \mathbf{j}^{S}_{it-1}\phi_4' + \mathbf{y}^{h,I}_{it-1}\alpha_1' + \mathbf{y}^{h,S}_{it-1}\alpha_2' \\ & + \mathbf{x}_{it}\gamma_1' + \mathbf{z}_{it}\gamma_2' + \theta_i + \xi_{gt} + \zeta_{sy} + u_{it} \end{aligned} \tag{3}$$

where $\mathbf{w}^{S_1}_{it-1}$ (resp. $\mathbf{w}^{S_2}_{it-k}$) is constructed analogously as $\mathbf{w}^{S}_{it-1}$ in Equation 1 but considering only peer infractions that led to a one-day suspension (resp. to a suspension of at least two days). Under the assumption that, conditional on our controls, short suspensions depend on factors that do not directly affect the behavior of the offender's peers, comparing

$\phi_{2(1)}$ to ϕ_1 can inform about the causal effect on a student's behavior of peers receiving a (short) suspension, relative to them simply engaging in misbehavior.

Second, we further distinguish between suspension incidents leading to in-school versus out-of-school suspensions. The intuition behind this strategy is that infractions that triggered in-school suspensions (ISS) are likely to be much closer in nature to the ones that did not yield a suspension that those that triggered an out-of-school suspensions (OSS). Also accounting for the length of suspensions, we consider the following regression:

$$\begin{aligned} y_{it} = & \mathbf{w}_{it-1}^{I}\phi_1' + \mathbf{w}_{it-1}^{ISS_1}\phi_{2(1)}' + \mathbf{w}_{it-1}^{ISS_2}\phi_{2(2)}' + \mathbf{w}_{it-1}^{OSS_1}\phi_{2(3)}' + \mathbf{w}_{it-1}^{OSS_2}\phi_{2(4)}' \\ & + \mathbf{j}_{it-1}^{I}\phi_3' + \mathbf{j}_{it-1}^{S}\phi_4' + \mathbf{y}_{it-1}^{h,I}\alpha_1' + \mathbf{y}_{it-1}^{h,S}\alpha_2' \\ & + \mathbf{x}_{it}\gamma_1' + \mathbf{z}_{it}\gamma_2' + \theta_i + \xi_{gt} + \zeta_{sy} + u_{it} \end{aligned} \tag{4}$$

where $\mathbf{w}_{it-1}^{ISS_1}$ (resp. $\mathbf{w}_{it-k}^{OSS_1}$) is constructed analogously as $\mathbf{w}_{it-1}^{S_1}$ in Equation 3 but considering only peer infractions that led to a one-day ISS (resp. a one-day OSS). The variables $\mathbf{w}_{it-1}^{ISS_2}$ and $\mathbf{w}_{it-1}^{OSS_2}$ account for peer infractions that led to ISS and OSS, respectively, lasting at least two days. Intuitively, ISS incidents represent punishments for less serious incidents than OSS suspensions. Thus, under the assumption that, conditional on our controls, short ISS suspensions depend on factors that do not directly affect the behavior of the offender's peers, comparing $\phi_{2(1)}$ to ϕ_1 can inform about the causal effect on a student's behavior of peers receiving a (short ISS) suspension, relative to them simply engaging in misbehavior.

4 Results

4.1 Main Results

Table 3 presents the main results of our analysis from estimating Equation (1). The outcome variable in Column 1 is an indicator variable taking a value of one if the student receives a disciplinary infraction (that may or may not lead to a suspension) in period t and zero otherwise.[11] The outcome variable in Column 2 is a count of the number of infractions the student receives in period t. All equations control for the full set of time-varying individual and peer controls described in Equation (1), as well as individual fixed effects, school-by-period fixed effects, and school-by-grade fixed effects.

Results indicate that a peer non-suspension incident two periods (three to four weeks) before the current period does not significantly affect the propensity for a student to misbehave in the current period. Similarly, peer suspension incidents during this time period

[11] In our preferred specification, t denotes a two-week period.

Table 3: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.010***	0.021***
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.002	0.001
	(0.003)	(0.005)
Wt. Peer Suspension Inc. at $t-1$	0.003*	0.006**
	(0.001)	(0.002)
Wt. Peer Suspension Inc. at $t-2$	0.001	0.002
	(0.001)	(0.002)
Mean	0.0580	0.0671
Obs.	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

do not have an effect on student misbehavior in the current period. However, results do indicate that disruptive peers in the immediate two-week period leading up to the current weekend does affect student misbehavior. Specifically, a one-unit increase in the *weighted count* of peer non-suspension incidents during the two weeks preceding period t raises the probability that a student is involved in a disciplinary incident in period t by 1.0 percentage points (pp). To interpret the magnitude of this effect, two clarifications are helpful. First, a one-unit increase in the weighted peer suspension measure corresponds to a scenario in which all of a student's peers are suspended once. On average, a student has approximately 2.5 suspension peers in a given period, and the average weight

of a single peer is approximately 0.5.[12,13] This in turn indicates that the suspension of a single peer increases the weighted count of peer suspensions by 0.5 on average for a student with peers. Second, this 1.0-pp increase should be evaluated relative to the baseline infraction rate of 5.8 percent per period—implying a substantial relative effect. Taken all together, the suspension of a single peer during the two weeks preceding period t raises the probability that a student is involved in a disciplinary incident in period t by 8.6 percent.[14] Column 2 indicates that a one-unit increase in the weighted count of peer non-suspension incidents during the two weeks preceding period t increases the number of incidents a student is involved in a disciplinary incident in period t by 0.021, a 15.6 percent increase from the mean.

Results also indicate that a higher share of peer suspension incidents during the two weeks preceding period t raises the probability that a student is involved in a disciplinary incident in period t. A one-unit increase in the weighted count of peer suspension incidents during the two weeks preceding period t raises the probability that a student is involved in a disciplinary incident in period t by 0.3 pp (2.6 percent increase from the mean), although estimates are only marginally significant. This increases the number of incidents students are involved in during period t by 0.006 (4.5 percent increase from the mean).

The findings in Table 3 suggest that perhaps peer suspensions have deterrent spillover effects in reducing disruptive behavior in other students, as the magnitude of the increase in misbehavior after a peer incident is attenuated when the peer is suspended, compared to when the peer is not suspended. However, an alternative explanation is that incidents that result in suspension may be fundamentally different in nature from incidents that do not result in a suspension, and unobserved differences in the nature of these peer infractions are driving differences in a student's own disciplinary outcomes in the weeks following the peer incident.

To investigate this possibility, we examine whether the effects differ between peer

[12]This is smaller than the 4.01 number of average peers reported in Table 1 because the table reports the average number of peers for a student over the entire sample period. Students will generally have fewer peer in earlier periods because they have not yet formed peer relations with some of their peers through joint infractions.

[13]The average peer weight is computed as the average of $1/N_{it}$ over student-periods, where N_{it} is the number of peers of student i in period t. The average peer count is calculated as the average of N_{it} over the same set of student-periods. Because the inverse is a non-linear operator, $\mathbb{E}[1/N_{it}]$ need not equal $1/\mathbb{E}[N_{it}]$ when N_{it} varies across student-periods, so the average peer weight is not equal to the inverse of the mean number of peers.

[14]$0.086 = (0.01 \times 0.5)/0.058$

suspensions that last one day or less and those that last more than one day. The rationale is that if our results are primarily driven by the severity of infractions, more serious misbehavior—those clearly distinct from non-suspendable behaviors—should lead to longer suspensions. In contrast, short suspension spells likely reflect misbehaviors that are closer to the disciplinary threshold in nature, more comparable in nature to incidents that did not result in suspension. Consequently, in Table 4, we focus our comparison on infractions that did not result in suspensions versus those that resulted in short suspensions (that is, lasting one day or less). For context, 43% of suspension incidents among students in grades 6–8 during the 2016–2018 academic years lasted one day or less.

The results in Table 4 show that the observed effects of peer suspensions on increasing misbehavior are driven by short peer suspensions rather than longer ones. Peer suspensions lasting one day or less in periods $t-1$ and $t-2$ both increase the likelihood that a student will commit a disciplinary infraction in period t, as well as the number of infractions committed. In contrast, peer suspensions lasting more than one day—indicative of more serious incidents—do not have a significant estimated effect on a student's subsequent behavior and are also very small in magnitude.

When we compare the effects of non-suspension peer incidents to peer misbehavior incidents that are more comparable in nature, i.e., those leading to a suspension of one day or less, we no longer find that suspensions have a deterrent spillover effect on peer behavior. The effects of peer misbehavior in the two-week period leading up to the current week are similar between the two types of incidents. Furthermore, peer suspension incidents leading to one day of suspension or less in two periods prior to the current period also increase student misbehavior, while we find no effects on non-suspension peer incidents in period $t-2$ on student behavior in the current period.

Table 5 further restricts our comparisons to separating peer incidents resulting in in-school-suspensions (ISS) from those resulting in out-of-school suspensions (OSS). Intuitively, more serious incidents tend to result in OSS, while less serious ones result in ISS. Thus, non-suspension incidents are most comparable to ISS incidents. Results in Table 5 lead to similar conclusions to those in Table 4: Comparisons of non-suspension peer incidents and ISS peer incidents do not indicate that suspensions help to deter peer misbehavior.[15]

[15]In cases where a student receives both ISS and OSS for an incident, we categorize the incident under OSS since OSS denotes the more serious of the two disciplinary measures.

Table 4: Effects of Peer Disciplinary Infractions and Suspensions on Own Disciplinary Outcomes Split by Suspension Length ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.010***	0.020***
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.002	0.001
	(0.003)	(0.005)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-1$	0.009***	0.017***
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-2$	0.006**	0.011***
	(0.003)	(0.004)
Wt. Peer Susp. Lasting > 1 Day at $t-1$	-0.000	0.000
	(0.002)	(0.002)
Wt. Peer Susp. Lasting > 1 Day at $t-2$	-0.002	-0.002
	(0.002)	(0.002)
Mean	0.0580	0.0671
Obs	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

4.2 Robustness Checks

We conduct several tests to assess the robustness of our results. First, we conduct a placebo test in which students are randomly assigned to *placebo* peers within the same school. This test assesses whether our empirical strategy captures true peer effects rather than spurious correlations. For instance, one potential concern is that some students might be broadly sensitive to school-wide disruptions and misbehave in response to gen-

Table 5: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length, ISS, and OSS ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.010***	0.020***
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.002	0.001
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-1$	0.009***	0.018***
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-2$	0.010***	0.016***
	(0.003)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-1$	0.002	0.005
	(0.003)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-2$	-0.001	0.000
	(0.002)	(0.004)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-1$	0.005	0.014
	(0.006)	(0.010)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-2$	-0.004	-0.009
	(0.005)	(0.007)
Wt. Peer OSS Lasting > 1 Day at $t-1$	-0.002	-0.003
	(0.002)	(0.003)
Wt. Peer OSS Lasting > 1 Day at $t-2$	-0.002	-0.002
	(0.002)	(0.003)
Mean	0.0580	0.0671
Obs.	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics. Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics. All specifications include individual, school-week, and school-grade fixed effects.

eral environmental factors, creating spurious correlations with peer behavior. However, the placebo results help rule out this possibility. If the identification strategy is valid, in-

cidents involving placebo peers—who are not actual behavioral peers—should have no impact on a student's own behavior. Each student is assigned the same number of random peers as their actual number of disciplinary peers, excluding both their true peers and the true peers of those peers to prevent contamination from real peer effects. A detailed description of the placebo peer construction procedure is provided in Appendix B. Since these assigned peers are not behaviorally linked, we assign them equal weights in the analysis. Table A4 in the appendix replicates Table 3 using placebo peers. Reassuringly, results indicate that neither placebo peer suspension incidents nor placebo peer non-suspension incidents in the two periods leading up to the current period affect student misbehavior in the current period.

As a further exploration of robustness to placebo peers, we perform an analogous falsification exercise for Table 4, which examines the effects of peer suspensions by suspension length. Reassuringly, the results in Table A5 in the appendix also show no significant estimated effect of randomly assigned placebo peers' behavior on a student's own disciplinary outcomes in the two periods leading up to the current one. Finally, we also replicate this falsification exercise for Table 5, and the results are shown in Table A6. We similarly find no statistically significant estimated effects of peer suspensions in the periods leading up to the current one on student misbehavior. These findings support the interpretation that the effects documented in our main results reflect genuine peer influence rather than unobserved confounding factors.

As a second validity check. we test the robustness of our peer network definition by excluding peer connections that were formed through fights and the use of aggressive behavior. Because fights and aggressive behavior are inherently adversarial in nature, students who are reported together for these incidents may be better conceptualized as antagonists rather than friends, and it is unclear if we should expect peer effects to operate similarly through these relationships.[16] Table A7 in the appendix re-estimates aggregate results looking at the effects of peer suspension incidents and non-suspension incidents after excluding peer connections formed through fights and aggressive behavior. Similarly to results in Table 3, Table A7 presents some suggestive evidence that peer suspensions may play a deterrent effect on student misbehavior. However, we next re-estimate the results splitting peer suspensions that last one day or less versus those that last more than one day, but excluding fights and aggressive behavior, in Table Table A8. These findings align with those in Table 4, indicating that incidents resulting in short peer suspensions, which are the most comparable to those that result in no suspensions, do not

[16]It is also not obvious that we should drop these relationships, as they do capture a peer connection, which is why we include them in our preferred specification.

have a deterrent effect on student misbehavior. These results are further echoed in Table A9, which split peer suspensions further by ISS and OSS.

Finally, we extend our estimations to look at the effects of peer suspension incidents and non-suspension incidents on student behavior using three lagged (two-week) periods instead of two lagged periods. Intuitively, we expect results to fade out as we get further away from the current period. Table A10 in the appendix re-estimates aggregate results using three lagged periods. Similarly to the main results in Table 3, we find that both peer suspension and non-suspension incidents in the period immediately prior increase student misbehavior in the current period, with larger effects on peer non-suspension incidents. Reassuringly, we find no effects of peer misbehavior three periods prior on student misbehavior in the current period. Table A11 divides peer suspensions by length. Here, also, we find that peer misbehavior three periods prior does not influence student behavior in the current period. Consistent with the results in table 4, we find evidence that peer misbehavior in the two periods leading up to the current one increases the propensity of a student to misbehave, although we find no evidence that peer suspensions have a deterrent effect. Table A12 extends the analysis looking at the effects of peer suspensions by ISS and OSS for three periods and also finds that the effects of peer misbehavior fade away by three periods.

5 Conclusion

This paper studies peer effects of student suspensions. Specifically, we use disciplinary peer networks constructed from rich administrative data on middle school students to estimate the change in the propensity for a student to get involved in a disciplinary infraction in the periods following a peer being suspended. Despite arguments for school suspensions serving as a tool to discourage peers from engaging in similar behaviors (Ewing, 2000), we do not find evidence that peer suspensions have a deterrent effect on student misbehavior. The results are robust to multiple checks that validate our key identification assumption, that there are no unobserved factors affecting both peers' propensity of getting into infractions and own propensity of getting into an infraction, controlling for baseline propensities and school-specific temporal shocks. First, we estimate our preferred specification using an alternative peer grouping that excludes the formation of peers from joint fighting infractions to address validity of our network construction. Second, we test the inclusion of two additional periods of lagged peer infractions to test for a persistence effect. Finally, we perform falsification tests, assigning students random peers

from the same school. Our empirical results are robust across all checks.

These results do not support the notion that suspensions deter misbehavior. Accordingly, policymakers and school administrators should not rely on potential deterrence effects when weighing the costs and benefits of suspension policies. A promising direction for future research is to examine whether, and through what mechanisms, alternative interventions may more effectively deter student misbehavior.

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A Additional Tables and Figures

Figure A1 displays the average proportion of students in a school who receive at least one suspension or infraction in a given year for each year in the sample. Figure A2 in the Appendix displays frequencies of suspension length for all students in the full sample (top panel) and in the analytic sample (bottom panel). Most suspensions are short in nature, with suspensions three days or less accounting for approximately 90% and 86% of all suspensions in the middle school population and analytic sample, respectively.

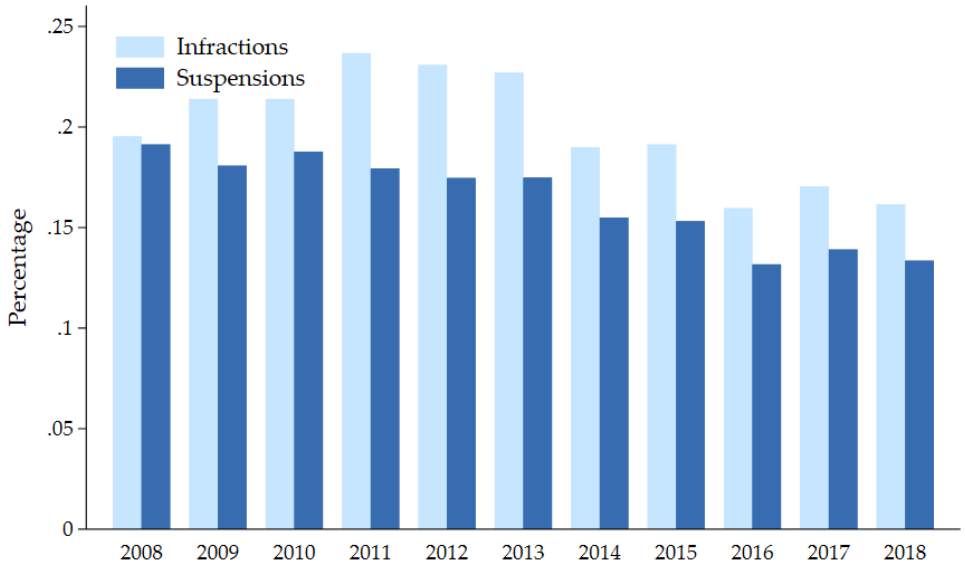

Figure A1: Proportion of Students Suspended and in Infractions 2009-2018

Source: NCERDC 2009-2018. Infractions are inclusive of those leading to a suspension, and students in middle school are included.

Table A1: Consequence Types per Incident

	Mean	Frequency
ISS	0.40	79,776
Short-term OSS	0.30	59,249
Long-term OSS	0.00	119
$>$ 365 Day OSS	0.00	1
Expulsion	0.00	1
Detention	0.02	4,324
Lunch Detention	0.03	5,674
Alt. Learning Program	0.01	1,671
Observations	197,908	

Note: Observations are at the incident level for students in grade 6 in 2016, grade 7 in 2017, and grade 8 in 2018. A short-term suspension is any suspension less than ten days in length, while a long-term suspension is any suspensions lasting 11-364 days.

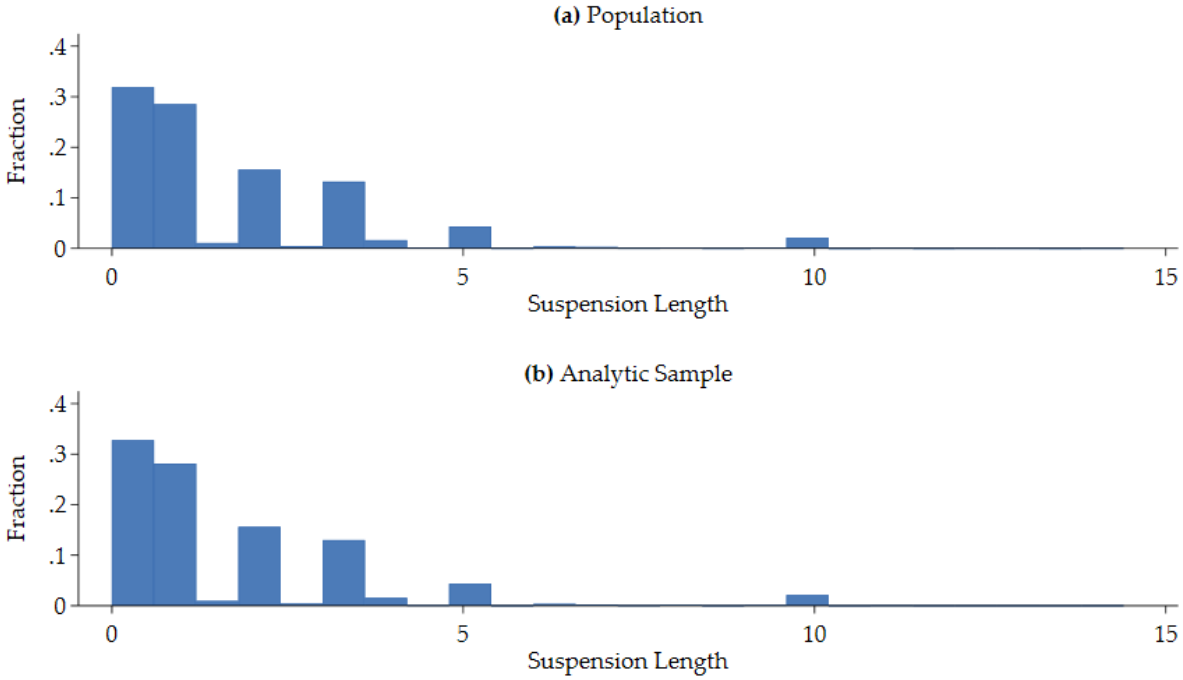

Figure A2: Suspension Length per Infraction. Note: Observations consider infraction units for students in grades 6-8 during 2016-2018 on the top panel and students in grade 6 in 2016, grade 7 in 2017, and grade 8 in 2018 in the bottom panel.

Table A2: Mean Characteristics of Students in Infractions

	(1) Population	(2) Analytic Sample	(3) Analytic Sample Students with Peers
Demographics			
Female	0.34	0.35	0.32
White	0.37	0.40	0.20
Black	0.40	0.39	0.60
Asian	0.01	0.01	0.01
Hispanic	0.16	0.16	0.16
Other Race	0.06	0.04	0.03
Economically Disadvantaged	0.67	0.66	0.81
Misbehavior and Peers			
Avg. incidents per year	2.50	1.76	4.87
	(3.52)	(2.43)	(4.15)
Avg. suspensions per year	1.75	1.23	3.30
	(2.86)	(1.75)	(2.92)
Avg. ISS per year	1.00	0.69	1.78
	(2.33)	(1.07)	(1.78)
Avg. OSS per year	0.75	0.53	1.52
	(1.32)	(0.99)	(1.76)
Avg. joint incidents per year	0.42	0.29	1.78
	(0.86)	(0.57)	(1.24)
Avg. susp. from joint incidents per year	0.30	0.21	1.19
	(0.67)	(0.44)	(0.98)
Has at least one peer	0.28	0.05	1.00
	(0.45)	(0.21)	(0.00)
Obs.	166,856	39,112	1,798

Note: Observations consider individual-academic year units for all students in grades 6-8 in 2016-2018 who are involved in at least one infraction during the academic year in the first column and students in 6th grade students in 2016, 7th grade students in 2017, and 8th grade students in 2018 in the second column. Columns 3 is a subset of column 2 conditioning on students with at least one joint infraction during the academic year. Standard errors of the mean are in parenthesis.

Table A3: Mean Characteristics of Students

	Students Never in Infractions	Students in Infractions
	Mean	Mean
Female	0.56	0.35
	(0.50)	(0.48)
White	0.56	0.40
	(0.50)	(0.49)
Black	0.18	0.39
	(0.38)	(0.49)
Asian	0.04	0.01
	(0.20)	(0.10)
Hispanic	0.17	0.16
	(0.37)	(0.37)
Other Race	0.05	0.04
	(0.22)	(0.21)
Economic Disadvantage Status	0.40	0.65
	(0.49)	(0.43)
Obs.	69,986	39,112

Note: Observations consider individual-academic year units for all students in 6th grade in 2016, 7th grade in 2017, and 8th students in 2018. Students with at least one infraction in an academic year are included in column 2. Standard errors of the mean are in parenthesis.

Table A4: Placebo Test: Effects of Randomly Assigned Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.002	0.002
	(0.004)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.004	-0.005
	(0.004)	(0.005)
Wt. Peer Susp. t-1	-0.002	-0.000
	(0.002)	(0.002)
Wt. Peer Susp. t-2	-0.000	-0.003
	(0.002)	(0.003)
Mean	0.0577	0.0667
Obs	2,135,397	2,135,397

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A5: Placebo Test: Effects of Randomly Assigned Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.001	0.001
	(0.004)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.004	-0.005
	(0.004)	(0.005)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-1$	-0.001	0.001
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-2$	0.004	0.002
	(0.003)	(0.004)
Wt. Peer Susp. Lasting > 1 Day at $t-1$	-0.002	-0.001
	(0.002)	(0.003)
Wt. Peer Susp. Lasting > 1 Day at $t-2$	-0.002	-0.006*
	(0.002)	(0.003)
Mean	0.0577	0.0667
Obs	2,135,397	2,135,397

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A6: Placebo Test: Effects of Randomly Assigned Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length, ISS, and OSS ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.001	0.001
	(0.004)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.004	-0.005
	(0.004)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-1$	0.001	0.004
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-2$	0.006	0.005
	(0.004)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-1$	-0.001	0.003
	(0.004)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-2$	-0.002	-0.006
	(0.004)	(0.005)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-1$	-0.007	-0.010
	(0.007)	(0.009)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-2$	-0.004	-0.006
	(0.008)	(0.010)
Wt. Peer OSS Lasting > 1 Day at $t-1$	-0.003	-0.004
	(0.003)	(0.004)
Wt. Peer OSS Lasting > 1 Day at $t-2$	-0.002	-0.005
	(0.003)	(0.004)
Mean	0.0577	0.0667
Obs	2,135,397	2,135,397

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A7: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes: Peers Formed From Non-Fighting Infractions ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.005*	0.015***
	(0.003)	(0.004)
Wt. Peer Non-Susp Inc. at $t-2$	-0.006**	-0.003
	(0.003)	(0.004)
Wt. Peer Suspension Inc. at $t-1$	-0.005***	-0.004*
	(0.001)	(0.002)
Wt. Peer Suspension Inc. at $t-2$	-0.006***	-0.006***
	(0.001)	(0.002)
Mean	0.0580	0.0671
Obs.	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status).All specifications include individual, school-week, and school-grade fixed effects.

Table A8: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length: Peers Formed From Non-Fighting Infractions ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.004	0.014***
	(0.003)	(0.004)
Wt. Peer Non-Susp. Inc. at $t-2$	-0.006**	-0.004
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-1$	0.004	0.012***
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-2$	0.001	0.004
	(0.003)	(0.004)
Wt. Peer Susp. Lasting > 1 Day at $t-1$	-0.009***	-0.010***
	(0.002)	(0.002)
Wt. Peer Susp. Lasting > 1 Day at $t-2$	-0.008***	-0.009***
	(0.002)	(0.002)
Mean	0.0580	0.0671
Obs.	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A9: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length, ISS, and OSS: Peers Formed From Non-Fighting Infractions ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.004	0.014***
	(0.003)	(0.004)
Wt. Peer Non-Susp. Inc. at $t-2$	-0.006**	-0.004
	(0.003)	(0.004)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-1$	0.005	0.012**
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-2$	0.006*	0.012**
	(0.003)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-1$	-0.004	-0.003
	(0.003)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-2$	-0.007***	-0.005
	(0.002)	(0.004)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-1$	0.001	0.010
	(0.005)	(0.009)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-2$	-0.012***	-0.019***
	(0.005)	(0.006)
Wt. Peer OSS Lasting > 1 Day at $t-1$	-0.009***	-0.011***
	(0.002)	(0.003)
Wt. Peer OSS Lasting > 1 Day at $t-2$	-0.007***	-0.008***
	(0.002)	(0.003)
Mean	0.0580	0.0671
Obs.	2,138,918	2,138,918

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A10: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes: 3 Lags ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.011***	0.022***
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.002	0.002
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-3$	-0.001	-0.001
	(0.003)	(0.005)
Wt. Peer Suspension Inc. at $t-1$	0.003**	0.006***
	(0.001)	(0.002)
Wt. Peer Suspension Inc. at $t-2$	0.001	0.002
	(0.001)	(0.002)
Wt. Peer Suspension Inc. at $t-3$	-0.002	-0.001
	(0.001)	(0.002)
Mean	0.0580	0.0671
Obs.	2,027,688	2,027,688

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A11: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes Split by Suspension Length: 3 Lags ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp Inc. at $t-1$	0.010***	0.021***
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-2$	-0.003	0.001
	(0.003)	(0.005)
Wt. Peer Non-Susp Inc. at $t-3$	-0.001	-0.001
	(0.003)	(0.005)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-1$	0.010***	0.019***
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-2$	0.007***	0.010***
	(0.003)	(0.004)
Wt. Peer Susp. Lasting $\leqslant 1$ Day at $t-3$	0.001	0.005
	(0.003)	(0.004)
Wt. Peer Susp. Lasting > 1 Day at $t-1$	-0.000	-0.000
	(0.002)	(0.003)
Wt. Peer Susp. Lasting > 1 Day at $t-2$	-0.001	-0.001
	(0.002)	(0.002)
Wt. Peer Susp. Lasting > 1 Day at $t-3$	-0.003*	-0.004
	(0.002)	(0.002)
Mean	0.0580	0.0671
Obs.	2,027,688	2,027,688

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

Table A12: Effects of Peer Disciplinary Incidents and Suspensions on Own Disciplinary Outcomes: ISS and OSS, 3 Lags ($t = 2$ weeks)

	(1) Any infraction in Period t	(2) Number of Infractions in Period t
Wt. Peer Non-Susp. Inc. at t-1	0.010***	0.021***
	(0.003)	(0.005)
Wt. Peer Non-Susp. Inc. at t-2	-0.002	0.001
	(0.003)	(0.005)
Wt. Peer Non-Susp. Inc. at t-3	-0.001	-0.001
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-1$	0.010***	0.019***
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-2$	0.010***	0.016***
	(0.003)	(0.005)
Wt. Peer ISS Lasting $\leqslant 1$ Day at $t-3$	0.001	0.006
	(0.003)	(0.004)
Wt. Peer ISS Lasting > 1 Day at $t-1$	0.003	0.005
	(0.003)	(0.005)
Wt. Peer ISS Lasting > 1 Day at $t-2$	-0.002	-0.000
	(0.003)	(0.004)
Wt. Peer ISS Lasting > 1 Day at $t-3$	-0.003	-0.002
	(0.003)	(0.005)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-1$	0.006	0.015
	(0.006)	(0.010)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-2$	-0.004	-0.010
	(0.005)	(0.006)
Wt. Peer OSS Lasting $\leqslant 1$ Day at $t-3$	0.001	-0.001
	(0.005)	(0.007)
Wt. Peer OSS Lasting > 1 Day at $t-1$	-0.002	-0.003
	(0.002)	(0.003)
Wt. Peer OSS Lasting > 1 Day at $t-2$	-0.001	-0.001
	(0.002)	(0.003)
Wt. Peer OSS Lasting > 1 Day at $t-3$	-0.003	-0.005*
	(0.002)	(0.003)
Mean	0.0580	0.0671
Obs.	2,027,688	2,027,688

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the school level. Controls include the student's cumulative number of non-suspension and suspension incidents to date, total number of non-suspension and suspension incidents in the previous academic year, cumulative peer count to date in the academic year, and time-varying individual characteristics (economic disadvantage status). Controls also include the cumulative weighted number of non-suspension and suspension incidents committed by the student's peers to date, their total weighted number of non-suspension and suspension incidents in the previous academic year, and their (weighted) demographics (sex, ethnicity, economic disadvantage status). All specifications include individual, school-week, and school-grade fixed effects.

B Placebo Peer Construction

To validate our peer effects estimates, we conduct a falsification test in which students are randomly assigned placebo peers. Placebo peers are drawn from the set of students who remain in the same school throughout the entire 2016-2018 sample period, comprising 83.4% of students. By construction, placebo peers largely start 6^{th} grade in 2016, complete 8^{th} grade in 2018, and therefore are typically in the same grade as the focal student, although grade alignment is not enforced.

Students are randomly assigned placebo peers at the beginning of the 2016 academic year and remain linked as long as both students attend the same school. If a student changes schools, they are assigned a new set of placebo peers starting the first week in the new school. Placebo peers are selected from students who are involved at least one suspension or non-suspension incident during the sample period and are not peers of a student's actual peers. To ensure comparability to disciplinary peers, we assign each student a number of placebo peers equal to their maximum number of disciplinary peers at a given school. This maximum may differ from the number of peers at the end of the sample period when a student's peer(s) leave the school. In cases where the number of available placebo peers is insufficient to match the number of disciplinary peers, we allow fewer matches. Such cases are minimal, as 92% of schools have at least 25 students continuously enrolled during the sample period.

To maintain a consistent comparison group and avoid excessive peer exposure, we drop students with more than 25 disciplinary peers from the analytic sample and from being considered as placebo peers. These students represent just 0.50% of the sample. This restriction ensures that placebo peers are not disproportionately drawn from students with unusually large peer networks that may reflect atypical disciplinary exposure. Additionally, we prevent peers of a student's actual peers from being considered as placebo peers, to further ensure separation between the actual and falsified networks.

Finally, schools that do not have any infractions involving more than one student during the sample period are excluded from this analysis. This restriction removes approximately 34.2% of schools when considering all grades.