

Exploring the relationships between school suspension, ADHD diagnoses, and delinquency across different school punitive and special education climates[☆]

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ABSTRACT

In this paper, we examine the relationships between school suspensions and/or ADHD diagnoses and delinquency across different school disciplinary and special education climates. Given how these childhood interventions are intended to improve schoolchildren's behavior and create a safe and predictable learning environment, it is critical for scholars to compare how these diverse yet connected responses to child misbehavior influence delinquent behavior. We use data from the Fragile Families and Child Well-Being Study ($n = 2,267$). Results from binomial regression models show that delinquency scores are higher among suspended children and children receiving both suspension and ADHD treatment, compared to young people who experience neither. Further, school context has a direct association with delinquency scores, as children attending schools with higher rates of school suspensions and special education enrollment have lower delinquency scores. Moreover, the relationship between individual childhood experiences with school suspension and/or ADHD treatment and delinquency is moderated by school context, especially regarding special education enrollment rates.

1. Introduction

Each year, approximately 2.5 million U.S. students are suspended from school (Civil Rights Data Collection (CRDC), 2021). At the same time, 6.1 million school-aged children are diagnosed with attention deficit hyperactivity disorder (ADHD), with nearly 2 in 3 receiving therapy or taking prescription medication for their diagnoses (Danielson et al., 2018) and roughly 2 million children are enrolled in in special education behavior plans for ADHD and similar conduct problems (Civil Rights Data Collection (CRDC), 2021). The use of suspension or medical diagnoses and special education for perceived childhood behavior problems reflects different philosophies regarding misbehavior and

involve different institutions, leading to different approaches (Hinshaw & Scheffler, 2014; Kern et al., 2019; Lamont, 2013). School suspensions are punishments imposed by schools that rely on negative consequences (e.g., exclusion) for misconduct to encourage good behavior (Bandura, 1977; Bear, 2012). ADHD diagnoses entail medical decisions made between doctors and caregivers, utilizing therapy and/or medication, and often involve schools implementing special education plans to promote appropriate behavior.

Given the potential implications of these fundamentally different yet common responses to children's problem behavior, it is critical that scholars compare how suspensions and ADHD diagnoses during childhood influence future behavior problems (e.g., delinquency). However,

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despite widespread use of suspensions and ADHD diagnoses, research on these topics remains siloed. Thus, while research connects school suspension experiences to delinquency (e.g., [Mittleman, 2018](#)) and ADHD diagnoses to delinquency (e.g., [Satterfield et al., 2007](#)), there is limited empirical work considering the outcomes of these different experiences (e.g., suspension only, ADHD diagnosis only, both suspension and ADHD diagnosis).

This oversight is critical because suspensions and ADHD diagnoses are not mutually exclusive. A substantial number of children are excluded and diagnosed and treated for ADHD ([Behnken et al., 2014](#); [Lavin, 2016](#); [Ramey, 2020a, b](#)). Further, child experiences with suspension and ADHD diagnoses occur across a variety of school contexts, including schools that suspend more students or schools that enroll more students in special education ([Lavin, 2016](#); [Wiley et al., 2020](#)). While school suspension rates have been shown to matter for outcomes associated with delinquency, including test scores and classroom behavior (e.g., [Perry & Morris, 2014](#)), there is scant literature on the impact of school special enrollment rates on individuals outside of special education outcomes and medical diagnoses (e.g., [Fulton et al., 2009](#); [Hinshaw & Scheffler, 2014](#)). Furthermore, it is unclear whether and how these school contextual measures may influence delinquency across children with different experiences with suspension and ADHD diagnosis. An analysis of these interactions is necessary to examine, for example, whether the relationship between school suspension or ADHD diagnoses and delinquency more or less pronounced across schools with high or lower special education enrollment rates.

In this paper, we use restricted School Supplemental data from the Fragile Families and Child Well-Being Study and CRDC data on school-level rates of school punishment and special education enrollment to answer three overarching questions: First, what is the relationship between suspension, ADHD diagnoses, and delinquency? Second, do school suspension and special education enrollment rates influence delinquency? Third, does the relationship between suspension or ADHD diagnosis and delinquency vary across schools with different suspension and special education enrollment rates?

2. Background

2.1. School suspensions and delinquency

Schools use suspensions to deter misbehavior and reduce classroom disruptions ([Bear, 2012](#); [Lamont, 2013](#)). School disciplinary policies vary by state and across school districts, but most schools have policies in place that either mandate or permit suspension for serious offenses like weapons or violence, while suspensions for more subjective violations such as defiance or disruption are common as well ([Curran, 2017](#)). Even as states and districts temper some of their stricter policies (e.g., California's bans on "willful defiance" suspensions), there is strong evidence suggesting that experiences with suspension during middle school or early high school can have lasting implications across several outcomes (e.g., [Mittleman, 2018](#); [Ramey, 2020a](#)).

For suspended children, the negative academic and social experiences of this exclusion are intended to convey serious consequences of school misbehavior and discourage children who receive the punishment from breaking the rules in the future ([Apel, Pogarsky, & Bates, 2009](#); [Bandura, 1977, 1986](#); [Bear, 2012](#)). However, extant work suggests that suspensions do not encourage suspended children to improve their behavior. Instead, scholars draw on labeling theory to argue that school suspensions may contribute to delinquency through a process of stigma and secondary deviance ([Gerlinger et al., 2021](#); [Jacobsen, 2020](#); [Lemert, 1951](#); [Mowen, Brent, & Boman, 2020](#)). Teachers and others label suspended children as "troublemakers," providing less instructional time and blaming them for problems in the school and classroom ([Bowditch, 1993](#); [Ferguson, 2001](#); [Lavin, 2016](#)). Suspended children also experience "horizontal labeling" by their pro-social peers as they become excluded from certain activities because of their perceived behavior ([Ferguson,](#)

[2001](#); [Jacobsen, 2020](#); [Kupchik, 2010](#); [Lavin, 2016](#)). In time, suspended children become acutely aware of their label, contributing to declining self-esteem and severing social bonds that discourage delinquency ([Bernburg, 2009](#); [Bowditch, 1993](#); [Ferguson, 2001](#); [Kim, et al., 2010](#); [Paternoster & Iovanni, 1989](#)).

Recent research emphasizes how these labeling processes can contribute to delinquency following school suspension. Suspended children are more likely than non-suspended children to be involved in crime ([Mowen, Brent, & Boman, 2020](#); [Widdowson, Garduno, & Fisher, 2021](#); [Wiley et al., 2020](#)); encounter the police ([Jackson et al., 2021](#)), and become involved with the criminal justice system ([Mittleman, 2018](#); [Monahan et al., 2014](#); [Mowen & Brent, 2016](#); [Ramey, 2016](#)). Though there is much extant work on the relationship between experiences with school suspensions and delinquency, we know little about how suspensions compare with other forms of child social control, particularly medicalization via ADHD diagnoses, or whether the suspension and delinquency relationship exists across different school punitive or special education climates. Addressing this gap is a key contribution of the current paper.

2.2. ADHD and delinquency

There is limited research on ADHD diagnoses and delinquency. Some scholars connect symptoms of ADHD (e.g., restlessness, impulsivity) to characteristics of low self-control, a common correlate of delinquent behavior ([Gottfredson & Hirschi, 1990](#); [Pratt et al., 2002](#); [Schoepfer, Reitzel, & Norris, 2019](#)). ADHD diagnosis during childhood is associated with a higher risk of arrest and conviction during adulthood ([Koisaari et al., 2015](#); [van der Maas et al., 2018](#)). Estimates of incarcerated populations suggest that 26 % of incarcerated persons in U.S. prison and jails have ADHD ([Baggio et al., 2018](#)). Youth diagnosed with ADHD are more likely to engage in delinquent acts prior to their 15th birthday ([Satterfield et al., 2007](#)) and are arrested at younger ages than youth without ADHD ([Retz et al., 2021](#)).

Importantly, most extant research connecting ADHD to delinquency focuses on how symptoms of the disorder influence behavior. There is less work considering how ADHD diagnoses (and/or treatment) may influence delinquency after controlling for underlying behavior problems. Many scholars argue that, similar to school exclusions, ADHD diagnoses contribute to a process of labeling and stigma. Medical or psychological diagnoses are turning points in which formal institutions label (or re-label) children according to their behavior ([dosReis et al., 2010](#); [Link & Phelan, 2010](#)). These medicalized labels can be stigmatizing, particularly when the labels are associated with stereotypically problematic social characteristics ([Link & Phelan 2001, 2010](#); [Link et al., 1989](#)). Although ADHD carries less stigma now than in the past, if children internalize negative stereotypes regarding their disorder, they risk other future problems, including delinquency ([Breslau et al., 2011](#); [Owens, 2020](#)).

Conversely, several scholars suggest that labels associated with ADHD diagnoses do not carry the same stigma as punitive labels associated with school suspension. Unlike school suspensions, ADHD diagnoses are not made public unless parents choose to share information with the school and schools may not share information with other students or the community ([Hinshaw & Scheffler, 2014](#)). Even when others are aware of behavioral diagnoses, any labeling experiences may be offset by behavioral benefits that accompany treatment ([Conrad, 2007](#); [Hinshaw & Scheffler, 2014](#); [Link & Phelan, 2010](#)). Evidence suggests that ADHD diagnoses and treatment can be effective at helping manage symptoms of common behavior problems ([Barkley, 1997, 2002](#); [Millichamp, 2010](#)). Medical and psychological labels are also considered more inclusive and redeeming than punitive labels ([Conrad, 1992](#); [Heitzeg, 2016](#); [Rosenfield, 1997](#); [Zola, 1974](#)). Children diagnosed with ADHD may receive social and material support needed to combat declining confidence and self-esteem ([Link & Phelan, 2010](#); [Rosenfield, 1997](#)), including special education services in school ([Hinshaw &](#)

Scheffler, 2014; Zirkel, 2011). Consequently, for school-aged children with behavior problems, ADHD diagnosis/treatment may not contribute to delinquency in the same manner as suspension.

2.3. Interactions between school suspension and ADHD diagnoses

To date, there is no research on how suspension and ADHD diagnoses interact to influence delinquency. This oversight is critical. Many children experience both suspension and receive therapy/medication for behavior problems. For these children, suspension and ADHD diagnoses may contribute to cumulative disadvantage, in which the double stigma associated with suspension and ADHD diagnoses lead to serious and frequent delinquency (Lavin, 2016; Ramey, 2016). Alternatively, many children who receive ADHD diagnoses without being suspended may not experience the same labeling or stigma as suspended children. Consequently, children who experience ADHD diagnoses may demonstrate lower levels of delinquency than children who experience only school suspension or suspension and ADHD diagnoses.

To examine children's categorically different experiences with suspensions and ADHD diagnosis and treatment, we seek to answer the following research question. (RQ1): What is the difference in delinquency scores between children who were neither suspended nor received ADHD diagnoses, only received ADHD treatment, only experienced suspension, or experienced both ADHD diagnoses and suspension?

2.4. School punishment Rates, school special education enrollment Rates, and delinquency

2.4.1. School exclusionary discipline rates and delinquency

The literature discussed so far focuses primarily on the direct relationship between experiences with suspension or ADHD diagnoses and delinquency. However, schools' disciplinary and special education practices may also influence delinquency. Schools use suspensions and special education to manage classroom disruptions and promote model behavior. According to social learning theory, punishment can be used to motivate desired behaviors by demonstrating and reinforcing the negative consequences of undesired behavior (Bandura 1977, 1986). In the case of schools, the use of suspensions sends a message to all students that misbehavior has serious consequences (Apel, et al., 2009; Bear, 2012; Nixon & Barnes, 2019; Wright et al., 2014), both in the classroom (Bear, 2012) and throughout the community (Zimmerman & Rees, 2014). Schoolchildren who observe their excluded peers struggling with the consequences of their punishment may decide against engaging in similar misbehaviors (Bandura, 1986; Bear, 2012). Thus, children in schools with high suspension rates may be less delinquent than children in schools with low suspension rates.

On the other hand, schools' frequent use of suspensions may not contribute to lower levels of delinquency. A growing body of evidence suggests that suspension rates negatively affect the performance of all students, including non-suspended students (Kupchik, 2010; Perry & Morris, 2014). Perry and Morris (2014) found that both punished and non-punished children in schools with high suspension rates had lower reading and math standardized scores than children in schools with lower suspension rates. Similarly, Craig and Martin (2019) found that school-wide improvement in test scores following the implementation is disciplinary reforms was driven by non-suspended children. Moreover, frequent suspension use may not signal what is or is not acceptable behavior. Instead, these schools may be seen by students as "too punitive" and risk losing their moral authority and legitimacy, fostering an environment of apathy (Morris, 2005) and even misbehavior (Bell, 2019; Way, 2012). In terms of motivating pro-social behavior, schools' frequent use of discipline that is considered "too strict" may be as ineffective as school discipline contexts seen as too lenient (Gottfredson et al., 2005; Peguero et al., 2018).

2.5. Special education enrollment rates and delinquency

To our knowledge, there is no study considering whether attending schools with high rates of enrollment in special education is associated with delinquency. In many ways, broad implementation of special education is part of a larger shift in the school climate from one focused on punishment to one focused on rehabilitation (Payne & Welch, 2010; Ramey, 2020b). While primarily focused on individual students, schools may use special education to send messages to all students about what behaviors are acceptable, offering positive reinforcements and behavior management strategies (McLeskey et al., 2017; Royer et al., 2019). This positive reinforcement helps to provide models of "good" behavior for students to adopt (Bandura, 1977), while stressing rehabilitative strategies helps to destigmatize certain disruptive or deviant behaviors (Conrad, 2007). Whereas schools with high rates of suspension contribute to a stressful environment in which the threat of punishment interferes with basic learning and social interactions (Kupchik, 2010; Perry & Morris, 2014), schools with high rates of special education enrollment may convey messages that the rules are fair, students who misbehave are not inherently bad (Conrad, 1992), and there are non-punitive solutions for struggling students (Kim et al., 2010). With a focus on support and inclusion rather than exclusion, schools with high rates of special education enrollment may foster more attachment to school rules than schools with high rates of school punishment (Conrad, 1992; Heitzeg, 2016; Zola, 1974).

Conversely, special education enrollment may not influence delinquency at all or may increase delinquency. For example, schools with high proportions of students enrolled in IEPs may experience a strain on the academic and social resources available to the entire student body (Needham & Houck, 2019; Peyton et al., 2020). Resources may be diluted, leaving the needs of at-risk children unmet, leading to several problems during adolescence (Bussing et al., 1998a, b; Needham & Houck, 2019), including delinquency. This may be particularly true for children with behavior problems or other risk factors (Kim et al., 2010).

To address how school-level suspension and special education enrollment rates influence behavior, we ask two research questions. (RQ2): Do children attending schools with higher exclusion rates have higher or lower delinquency scores than children attending schools with lower exclusion rates? (RQ3): Do children attending schools with higher special education enrollment rates have higher or lower delinquency scores than children attending schools with lower special education enrollment rates?

2.6. Interactions among school practices and childhood experiences

Schoolchildren experience a complex and interacting web of school practices and individual experiences. It is possible that experiences with suspension or ADHD treatment differ across schools with higher or lower rates of school suspensions or special education enrollment. In schools with high suspension rates, suspensions may be viewed positively and carry social value which may carry into out of school behavior (Anderson, 1999; Bell, 2019). Thus, the stigma of school suspension may be stronger in schools with low suspension rates than in schools with high suspension rates. Similarly, suspended children and non-suspended children may interpret messages associated with schools' frequent (or infrequent) use of exclusion in different ways. For instance, Bear (2012) found that strict school disciplinary practices that lead to high suspension rates deter non-suspended children, but contributed to worse behavior among those suspended. More recently, however, in a study of school exclusions, school climate, and future delinquency, Wiley and colleagues (2020) found that suspensions are associated with misbehavior, regardless of school punitive climates.

Less is known about whether school rates of special education condition the relationship between exclusion or ADHD treatment and behavior. For example, any positive benefits associated with school special education enrollment may not extend to children who have not

been diagnosed or treated for ADHD because they may not be eligible to access these resources. This may be particularly problematic for suspended children, who may display symptoms of behavior disorders such as ADHD, yet are not diagnosed, are not treated, and may never be considered eligible for school services. Consequently, the needs of these children can go unmet and their behaviors may escalate into delinquency during adolescence (Bussing et al., 1998a, b; Lavin, 2016). Moreover, suspended children who are not diagnosed with ADHD may experience multiple forms of stigma, as the perception that they are particularly troublesome and difficult to treat may be exacerbated in schools with high rates of special education services, where diagnosed children may be considered more amenable to school interventions, regardless of suspension experiences. Thus, suspended children who are not diagnosed with ADHD may internalize negative messages about their behavior, leading to higher levels of delinquency.

To examine these interaction effects, our last three research questions ask: (RQ4): Do school suspension rates moderate the relationship between school suspension, ADHD treatment, and delinquency? (RQ5): Do special education rates moderate the relationship between school suspension, ADHD treatment, and delinquency?

3. Data and methods

The primary data source for this manuscript is the Fragile Families and Child Wellbeing Study (FFCWS). This longitudinal study collected data on 4,898 children born between 1998 and 2000 and their birth parents. Data were collected using a stratified random sample of 20 U.S. cities with populations over 200,000. Hospitals were sampled within each city, and births were sampled within each hospital. The child's birth mother and father were interviewed shortly after the baby's birth. There were five follow-up waves were collected around the focal child's 1st, 3rd, 5th, 9th, and 15th birthdays in the years 1999–2001, 2001–2003, 2003–2006, 2007–2010, and 2014–2017, respectively. Children were interviewed for the first time during Wave 5 (~age 9). The data are nationally representative of births in large cities in the U.S. All individual and family-level variables come from the baseline (birth), Wave 5 (~age 9), and Wave 6 (~age 15) public-use files.

School-level information comes from two restricted Fragile Families' datasets. School demographic and administrative variables come from the restricted supplemental school characteristics file, which includes data from the National Center for Education Statistics (NCES) Common Core at Waves 5 and 6. Data on school suspensions and special education enrollment come from the U.S. Department of Education Civil Rights Data Collection for the school years 2009–2010, 2013–2014, and 2015–2016, as they correspond to the Waves 5 and 6.

3.1. Missing data and sample restrictions

The original FFCWS study included information on 4,898 children. The Wave 6 data that we use in this study included 3,444 adolescents (out of 4,663 eligible youth). The primary reason for this reduction is participant attrition. Prior research suggest that attrition was particularly problematic during the early waves of the study and that those families lost to attrition were significantly worse off economically and experienced greater family problems (e.g., Geller, Garfinkel, and Western, 2011). Furthermore, racial and ethnic minorities were less likely to participate in follow-up surveys than White families (Kamp Dush, 2013). Consequently, children and families lost to attrition are potentially at a greater risk for academic and behavioral problems than those observed in the study. Despite these shortcomings, we believe that the benefits of a large national dataset like the FFCWS, with its rich data on early child behaviors, information like school suspension and ADHD diagnoses, as well as the ability to link to datasets like the NCES and the CRDC, gives us the ability to address the previously unanswered questions we pose in the current study better than any dataset currently available and these benefits outweigh any limitations associated with attrition or non-

participation.

In addition to sample attrition, we make several other restrictions to our study sample. We restrict our sample to White, Black, and Hispanic children for whom we have CRDC data at Wave 6 ($n = 2,907$). Over 50 % of the remaining sample was missing data on at least one variable, including Wave 5 (~age 9) externalizing behaviors (10.7 %) and delinquency (10.6 %). We were also missing data on school racial/ethnic composition (8 %) and free-reduced lunch enrollment (11 %); mother's living arrangements (8 %) and self-control (7.5 %). To help address missing data concerns using multiple imputation with chained equations (MICE). MICE is an approach for estimating missing values in which a conditional distribution for missing data using the appropriate specification for each variable (e.g., OLS regression for continuous variables) and multiple datasets are created using Gibbs sampling techniques (Royston, 2005; van Buuren, 2012). We combine twenty distinct data sets using the `mi` command in Stata 14.0 to complete all descriptive and multivariate analyses. Following von Hippel (2007), we impute values for all variables (including the interaction terms) in each model and then delete observations with missing data on the dependent and central independent variables before running our regression analyses. After removing those observations that were missing or unable to contribute data for the dependent or central independent variables ($n = 640$), our final analytical sample includes 2,267 respondents.

3.2. Dependent variables

Our dependent variable, *delinquency*, is a scale constructed from the focal child's answers to 13 questions regarding their behavior during the Wave 6 survey (see Appendix A; $\alpha = 0.73$). The FFCWS delinquent behavior questions are adopted from similar measures in the Wave I and Wave II Home Visit interviews of the National Longitudinal Study of Adolescent Health (Add Health) (Fragile Families, 2021). This scale includes commonly asked questions regarding youth delinquent behavior (e.g., fighting, vandalism). This scale has been utilized in multiple studies of delinquency spanning over 30 years and has been shown to have high levels of concurrent, criterion, and predictive validity (Pechorro et al., 2019; Sieving et al., 2001).

3.3. Independent variables

School exclusion and ADHD diagnoses/treatment: We measure *school exclusion* using child and primary caregiver reports of having ever been suspended or expelled from school in either Wave 5 or Wave 6 (between ages 9 and 15). The wording of the question specifies exclusion "from school" and likely excludes some in-school suspensions, thereby underestimating the prevalence of school suspension in the sample. We measure *ADHD diagnoses/treatment* using self-reports of whether a doctor or medical professional said the child had ADD or ADHD or whether child had taken medication for ADD or ADHD during either Wave 5 or Wave 6 (between ages 9 and 15). Finally, because many children are both suspended and diagnosed with ADHD (Ramey, 2016; Lavin, 2016), we construct a categorical measure indicating whether a child was only suspended, only received ADHD diagnoses/treatment, or experienced both suspension and received ADHD diagnoses/treatment before Wave 6. Unless otherwise noted, the "neither punished nor received therapy/medication" during childhood is the reference group in all analyses.

School suspension rates and special education rates: We measure *school suspension rate* using the number of students suspended or expelled per 100 students during the Wave 6 school year. We measure *school special education rate* using a sum of the number of students who were provided services under the Individuals with Disabilities Act (IDEA) and the number of students who were covered under Section 504 per 100 students during the Wave 6 school year.

Table 1
Descriptive Statistics for all variables used in analyses, Fragile Families and Child Well-Being Study (n = 2,267).

| | Total Sample | | Neither ADHD Treatment nor School Suspension | | ADHD Treatment only | | School Suspension only | | ADHD Treatment and School Suspension | |
|--|--------------|--------|--|--------|---------------------|--------|------------------------|--------|--------------------------------------|--------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Dependent Variables | | | | | | | | | | |
| Delinquency | 1.118 | 0.035 | 0.611 | 0.034 | 0.713 | 0.103 | 1.711 | 0.073 | 2.060 | 0.137 |
| Independent Variables | | | | | | | | | | |
| <i>Child Social Control</i> | 0.506 | | | | | | | | | |
| Neither ADHD Treatment nor School Suspension | 0.075 | | | | | | | | | |
| ADHD Treatment | 0.307 | | | | | | | | | |
| School Suspension | 0.111 | | | | | | | | | |
| ADHD Treatment and School Suspension | | | | | | | | | | |
| <i>School Social Control</i> | | | | | | | | | | |
| School Special Education rates | 15.544 | 0.137 | 14.531 | 0.160 | 14.777 | 0.397 | 16.611 | 0.285 | 17.733 | 0.505 |
| School Punishment rates | 12.481 | 0.282 | 9.862 | 0.292 | 8.584 | 0.667 | 16.647 | 0.656 | 15.554 | 0.884 |
| Control Variables | | | | | | | | | | |
| Girls | 0.485 | | 0.590 | | 0.351 | | 0.424 | | 0.266 | |
| <i>Race/Ethnicity</i> | | | | | | | | | | |
| Non-Hispanic White | 0.227 | | 0.284 | | 0.468 | | 0.092 | | 0.175 | |
| Non-Hispanic Black | 0.528 | | 0.416 | | 0.269 | | 0.716 | | 0.690 | |
| Hispanic | 0.246 | | 0.300 | | 0.263 | | 0.193 | | 0.135 | |
| Mother or Father Foreign-Born | 0.132 | | 0.174 | | 0.123 | | 0.093 | | 0.052 | |
| Repeated Grade | 0.090 | | 0.044 | | 0.053 | | 0.128 | | 0.214 | |
| Delinquency (Wave 5) | 1.275 | 0.038 | 0.705 | 0.038 | 0.952 | 0.102 | 1.789 | 0.075 | 2.670 | 0.158 |
| <i>Mother Living Arrangements</i> | | | | | | | | | | |
| Non-married, Living Alone | 0.431 | | 0.365 | | 0.414 | | 0.518 | | 0.503 | |
| Married | 0.385 | | 0.474 | | 0.419 | | 0.272 | | 0.273 | |
| Cohabiting | 0.184 | | 0.161 | | 0.168 | | 0.210 | | 0.224 | |
| Poverty Rate | 0.312 | | 0.228 | | 0.275 | | 0.421 | | 0.417 | |
| Caregiver Using Drugs | 0.055 | | 0.038 | | 0.023 | | 0.083 | | 0.079 | |
| Father Ever Incarcerated | 0.483 | | 0.399 | | 0.427 | | 0.583 | | 0.628 | |
| Mother and Father Married at Birth | 0.222 | | 0.293 | | 0.333 | | 0.115 | | 0.123 | |
| <i>School & Neighborhood variables</i> | | | | | | | | | | |
| Neighborhood Disadvantage | -0.019 | 0.014 | -0.058 | 0.019 | -0.136 | 0.047 | 0.051 | 0.026 | 0.049 | 0.045 |
| School Percent Black | 36.884 | 0.732 | 28.959 | 0.932 | 21.222 | 2.175 | 49.640 | 1.372 | 48.384 | 2.187 |
| School Percent Hispanic | 25.061 | 0.589 | 27.758 | 0.855 | 29.904 | 2.356 | 21.599 | 0.987 | 19.050 | 1.574 |
| Charter School | 0.087 | 0.006 | 0.065 | 0.007 | 0.047 | 0.016 | 0.124 | 0.012 | 0.109 | 0.020 |
| School Percent Free and Reduced Lunch | 51.376 | 0.569 | 45.363 | 0.758 | 41.755 | 2.023 | 61.277 | 0.961 | 57.951 | 1.778 |
| School Enrollment | 1362.224 | 18.772 | 1473.547 | 27.457 | 1316.287 | 56.516 | 1241.226 | 33.547 | 1220.440 | 48.775 |

3.4. Control variables

We include several individual and school-level control variables associated with school punishment, ADHD treatment, and delinquency. We control for differences between boys and girls using a dummy variable equal to “1” if the respondent was *female*. We control for race/ethnicity of the focal child using a series of dummy variables for non-Hispanic White (reference), non-Hispanic Black, and Hispanic respondents. We consider a child to be *second-generation* if their mother and father were born outside of the U.S. We control for academic problems using a dummy variable equal to “1” if the focal child *repeated a grade* before the wave 6 survey. We control for parent/child relationships in adolescence using two dummy variables indicating whether the respondent was close to the biological parents during the Wave 6 interview (*close to mother, close to father*). We constructed these measures using the child’s answer to the questions, “How close do you feel to your biological mother/father?” (coded 1 = not very close, 2 = fairly close, 3 = quite close, 4 = extremely close), with a “1” on the dummy variable indicating the child was extremely close to their birth mother or father, respectively.

We include several behavioral variables associated with adolescent delinquency. We control for the effect of *peer deviance* during Wave 6 using a scale similar to our dependent variable scale (see [Appendix A](#); $\alpha = 0.85$). We control for *youth self-control* during Wave 6 using the same measure used in a recent paper using the FFCWS by [Jones, Pierce, and Chapple \(2021\)](#) that includes both self- and caregiver-reports of commonly asked behaviors associated with impulsivity and inability to delay gratification (see [Appendix A](#); $\alpha = 0.81$). Because children who

display early behavior problems are more likely to sustain their delinquency through adolescence ([Moffitt, 1993](#)), we include self-reported *delinquent behavior (Wave 5)* and *externalizing behaviors (Wave 5)*. The Wave 5 delinquency scale uses items modeled after the Things That You Have Done scale, containing questions found to be more appropriate for younger children (e.g., pre-adolescence) (see [Appendix A](#); $\alpha = 0.72$). The externalizing behavior scale was taken from the Child Behavior Checklist (CBCL), a common instrument for measuring child behavior (see [Appendix A](#); $\alpha = 0.76$).

We also include several family variables. We capture *mother’s living arrangements* using a series of dummy variables indicating whether the mother was non-married, living alone (reference); married; or cohabiting with a partner. Family income is a dummy variable equal to “1” if the family was *living under the poverty line* during Wave 6. To capture parents’ behavior, we account for *maternal self-control* during Wave 3 (see [Appendix A](#); $\alpha = 0.83$). To capture parents’ criminal involvement, we include dummy variables for *caregiver drug use* (1 = currently using) and *paternal incarceration* (1 = father has been incarcerated at least once prior to age 15). Finally, we include a dummy variable equal to “1” if the *mother was married to father at birth* ([Antle, Gibson, & Krohn, 2020](#); [Coyne et al., 2013](#)).

We include several neighborhood and school variables. *Neighborhood social order* is a standardized scale capturing caregiver-reports of neighborhood structural and social conditions (see [Appendix A](#); $\alpha = 0.86$). Racial and ethnic composition is the proportion of the school that is non-Hispanic Black (*percent Black*) and Hispanic (*percent Hispanic*). We include a measure of economic disadvantage using the percentage of students in the school receiving free or reduced lunches (*percent Free and*

Table 2
Results From Binomial Regression Models of Delinquency Scores at Age 15, Fragile Families and Child Well-Being Study (n = 2,267).

| | Model 1 | | | Model 2 | | | Model 3 | | | | | |
|---|---------|-----------|--------|---------|-----------|--------|---------|-----------|--------|----------|--------|--------|
| | OR | 95 % C.I. | | OR | 95 % C.I. | | OR | 95 % C.I. | | | | |
| ADHD Treatment | 1.138 | [0.833 | 1.553] | 1.213 | *** | [0.826 | 1.780] | 0.730 | [0.279 | 1.909] | | |
| School Suspension | 1.964 | *** | [1.675 | 2.304] | 1.832 | *** | [1.474 | 2.278] | 1.145 | * [0.791 | 1.659] | |
| ADHD Treatment and School Suspension | 2.207 | *** | [1.791 | 2.720] | 1.955 | | [1.442 | 2.650] | 1.785 | * [1.044 | 3.052] | |
| School Special Education rates | 1.004 | ** | [0.995 | 1.014] | 1.004 | | [0.995 | 1.014] | 0.980 | | [0.961 | 0.999] |
| School Punishment rates | 0.997 | | [0.992 | 1.001] | 0.991 | | [0.978 | 1.003] | 0.996 | | [0.991 | 1.001] |
| ADHD Treatment only* School Punishment rates | | | | 0.992 | | [0.955 | 1.030] | | | | | |
| School Suspension only* School Punishment rates | | | | 1.006 | | [0.994 | 1.019] | | | | | |
| ADHD Treatment and School Suspension* School Punishment rates | | | | 1.010 | | [0.993 | 1.027] | | | | | |
| ADHD Treatment only * School Special Education rates | | | | | | | | 1.031 | ** | [0.973 | 1.093] | |
| School Suspension only* School Special Education rates | | | | | | | | 1.036 | | [1.014 | 1.058] | |
| ADHD Treatment and School Suspension * School Special Education rates | | | | | | | | 1.017 | | [0.987 | 1.048] | |
| Control Variables | | | | | | | | | | | | |
| Repeated Grade | 1.048 | | [0.848 | 1.295] | 1.041 | *** | [0.843 | 1.287] | 1.050 | *** | [0.851 | 1.296] |
| Close to Mother | 0.750 | *** | [0.663 | 0.848] | 0.751 | ** | [0.663 | 0.849] | 0.752 | ** | [0.664 | 0.850] |
| Close to Father | 0.800 | ** | [0.689 | 0.928] | 0.800 | *** | [0.689 | 0.929] | 0.800 | *** | [0.689 | 0.929] |
| Peer Deviance (Wave 6) | 1.150 | *** | [1.131 | 1.169] | 1.150 | *** | [1.131 | 1.169] | 1.149 | *** | [1.131 | 1.168] |
| Child Self Control (Wave 6) | 0.976 | *** | [0.964 | 0.989] | 0.976 | | [0.963 | 0.988] | 0.976 | | [0.964 | 0.989] |
| Externalizing Behaviors (Wave 5) | 1.067 | | [0.960 | 1.186] | 1.069 | * | [0.961 | 1.188] | 1.071 | * | [0.964 | 1.190] |
| Delinquency (Wave 5) | 1.035 | * | [1.002 | 1.068] | 1.034 | *** | [1.001 | 1.067] | 1.034 | *** | [1.001 | 1.067] |
| Girls | 0.769 | *** | [0.678 | 0.873] | 0.769 | | [0.677 | 0.873] | 0.773 | | [0.681 | 0.878] |
| <i>Race/Ethnicity</i> | | | | | | | | | | | | |
| Non-Hispanic White | | | | | | | | | | | | |
| Non-Hispanic Black | 1.086 | | [0.878 | 1.343] | 1.093 | | [0.882 | 1.353] | 1.095 | | [0.888 | 1.351] |
| Hispanic | 1.132 | | [0.885 | 1.449] | 1.134 | | [0.886 | 1.451] | 1.141 | | [0.893 | 1.457] |
| Mother or Father Foreign-Born | 0.991 | | [0.779 | 1.262] | 0.990 | | [0.777 | 1.260] | 0.986 | | [0.774 | 1.255] |
| <i>Mother Living Arrangements</i> | | | | | | | | | | | | |
| Non-married, Living Alone | | | | | | | | | | | | |
| Married | 1.000 | | [0.856 | 1.168] | 0.998 | | [0.854 | 1.167] | 1.005 | | [0.860 | 1.174] |
| Cohabiting | 1.088 | | [0.918 | 1.289] | 1.089 | | [0.918 | 1.292] | 1.095 | | [0.924 | 1.298] |
| Poverty Rate | 1.010 | | [0.879 | 1.161] | 1.006 | ** | [0.875 | 1.156] | 1.007 | ** | [0.876 | 1.158] |
| Caregiver Using Drugs | 1.419 | ** | [1.120 | 1.798] | 1.411 | | [1.114 | 1.787] | 1.433 | | [1.132 | 1.814] |
| Maternal Self-Control | 1.011 | | [0.931 | 1.099] | 1.013 | | [0.932 | 1.101] | 1.006 | | [0.926 | 1.094] |
| Father Ever Incarcerated | 1.128 | | [0.989 | 1.286] | 1.133 | | [0.993 | 1.292] | 1.127 | | [0.988 | 1.287] |
| Mother and Father Married at Birth | 0.849 | | [0.698 | 1.032] | 0.847 | | [0.696 | 1.030] | 0.838 | | [0.691 | 1.018] |
| <i>School & Neighborhood variables</i> | | | | | | | | | | | | |
| Neighborhood Disadvantage | 0.929 | | [0.850 | 1.014] | 0.931 | | [0.853 | 1.017] | 0.923 | | [0.845 | 1.008] |
| School Percent Black | 1.000 | | [0.997 | 1.004] | 1.000 | | [0.997 | 1.004] | 1.000 | | [0.997 | 1.004] |
| School Percent Hispanic | 0.998 | | [0.995 | 1.002] | 0.998 | | [0.995 | 1.002] | 0.999 | | [0.995 | 1.002] |
| Charter School | 0.944 | | [0.752 | 1.185] | 0.943 | * | [0.751 | 1.184] | 0.937 | * | [0.749 | 1.173] |
| School Percent Free and Reduced Lunch | 1.004 | * | [1.000 | 1.008] | 1.004 | | [1.000 | 1.008] | 1.004 | | [1.000 | 1.008] |
| School Enrollment | 1.000 | | [1.000 | 1.000] | 1.000 | *** | [1.000 | 1.000] | 1.000 | *** | [1.000 | 1.000] |

Notes: OR = odds ratio.
p <.05 ** p <.01 *** p <.001

Reduced Lunch). We include a dummy variable equal to “1” if the school is a charter school. Finally, we control for total school enrollment.

3.5. Analytic strategy

The original delinquency questions provide a series of possible answers for each question (1 = not true; 2 = sometimes true; 3 = often true). Following prior research (Abeling-Judge, 2021; Bellair et al., 2021; Ozkan, Rocque, & Posick, 2019), we collapse each answer into 0/1 (“yes/no”) and sum the affirmative responses for our delinquency scale. Because our dependent variable is a sum of binary items, our delinquency score is a count variable that is bounded at both the lower-end (delinquency = 0) and upper-end (delinquency = 13). According to Britt et al. (2018), bounded variety scores capturing delinquency violate several assumptions of linear regression and are unsuitable for standard count models like Poisson or negative binomial regression because they can produce non-sensical predicted values (e.g., values greater than the upper-bound). Instead, Britt and colleagues (2018) recommend using binomial regression models. Binomial regression models account for lower- and upper-bounded count data by running a series of logistic regression “trials” for each potential value of the dependent variable (Britt et al., 2018). Coefficients for binomial regression variables can be

interpreted as the “effect” of a given variable \times on the log-odds of the focal child committing one additional act of delinquency (Britt et al., 2018). We use the *glm* command in Stata 14.0¹ to estimate binomial regression models and calculate marginal effects to examine interaction effects in non-linear models (Britt et al., 2018; Mize, 2019; Mustillo, Lizardo, & McVeigh, 2018).

4. Results

Table 1 presents descriptive statistics for all variables in the study for the total sample and for each category of individual suspension and ADHD treatment (i.e., neither suspended nor received ADHD treatment, received only ADHD treatment, only suspended, and both suspended and received ADHD treatment). Notably, almost half of the respondents had experiences with suspension and/or ADHD treatment. The proportion of respondents who experienced neither exclusion nor ADHD diagnoses is 0.506, 0.075 were diagnosed with ADHD without experiencing exclusionary discipline, 0.307 experienced exclusion

¹ Following Britt et al. (2018), we use the command *glm delinquency IVs, family(binomial) link(logit)*.

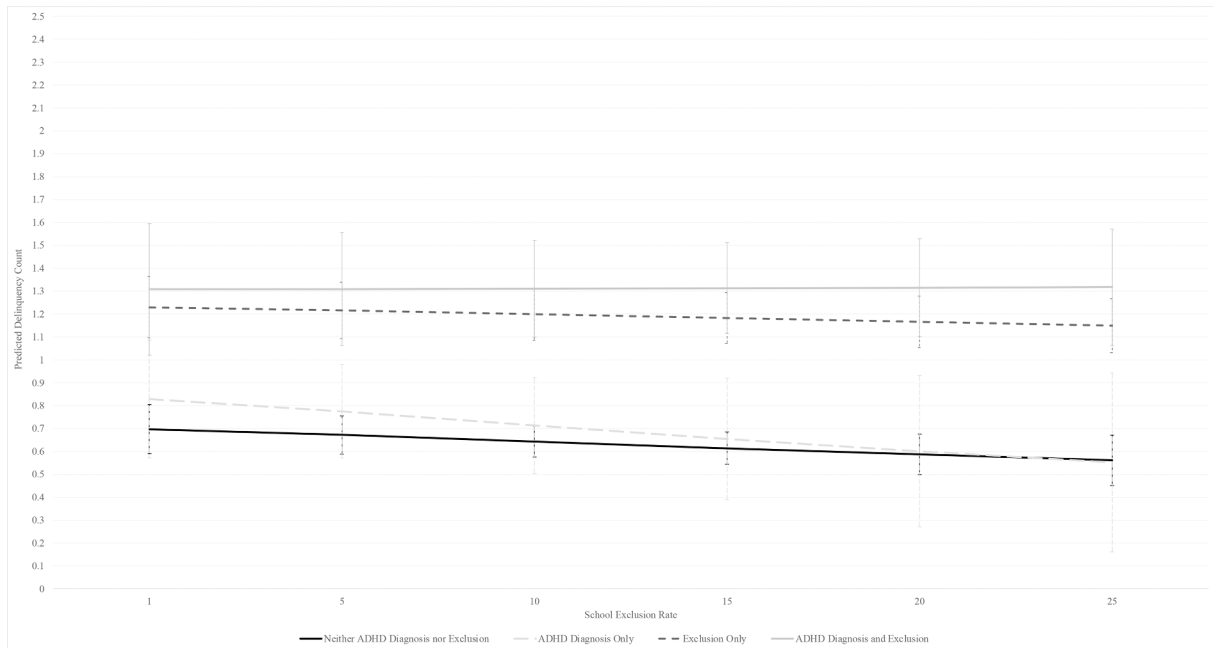


Fig. 1. Expected Counts of Delinquency for Children (Neither ADHD Diagnosis nor Exclusion, ADHD Diagnosis Only, Exclusion Only, ADHD Diagnosis and Exclusion) by School Exclusion Rates, Fragile Families and Child Well-Being Study (n = 2,267).

without ADHD diagnoses, and 0.111 experienced both exclusion and ADHD diagnoses. The average delinquency score in the sample is 1.1 delinquent behaviors and varies by suspension/ADHD experience. Among those who receive neither ADHD treatment nor suspension, the average delinquency score is 0.6, compared to an average delinquency score of 0.7 for those who receive only ADHD treatment, 1.7 for those who experience suspension only, and 2.1 for those who receive both ADHD treatment and suspension. School punishment and special education rates also vary by suspension/ADHD category. Overall, the average school special education rate is 15.5. For children who are neither suspended nor treated for ADHD, the average school special education rate is 14.5, compared to an average rate of 14.7 for those

only treated for ADHD, 16.6 for those only suspended, and 17.7 for those who are both suspended and treated for ADHD. The average school punishment rate is 12.5 for the total sample, compared to 9.8 for those who are neither treated for ADHD nor suspended, 8.6 for those only treated for ADHD, 16.6 for those only suspended, and 15.6 for those who are both suspended and treated for ADHD.

Table 2 presents odds ratios from binomial regression models predicting delinquency scores at age 15. In Model 1, suspension is associated with a 96 % increase in the odds of the respondent’s delinquency increasing by one behavior, compared to respondents who are never suspended and never receive ADHD treatment. Experiencing ADHD treatment and school suspension is associated with a 121 % increase in

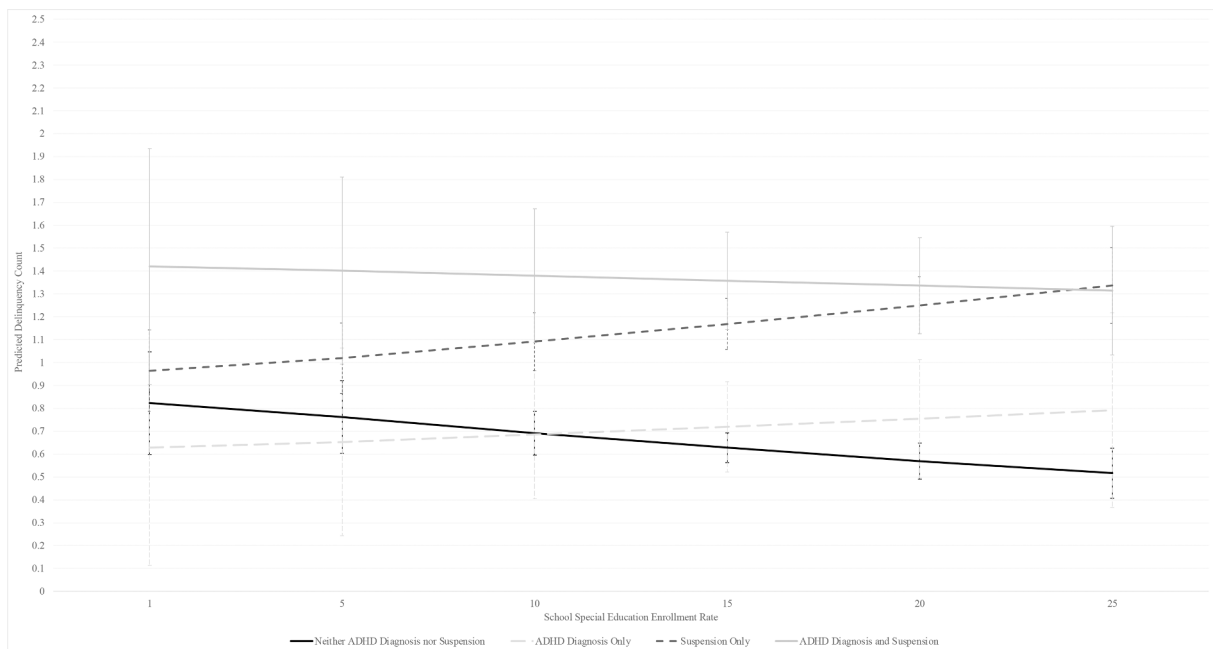


Fig. 2. Expected Counts of Delinquency for Children (Neither ADHD Diagnosis nor Suspension, ADHD Diagnosis Only, Suspension Only, ADHD Diagnosis and Suspension) by School Special Education Enrollment Rates, Fragile Families and Child Well-Being Study (n = 2,267).

the odds of delinquency increasing by one behavior, compared to those who do not receive suspension or ADHD treatment. Receiving only ADHD treatment is not significantly related to delinquency scores. School punishment and special education rates are not significantly associated with delinquency scores in Model 1.

Model 2 in Table 2 includes interaction terms between individual suspension/ADHD experiences and school punishment rates. Like results in Model 1, being suspended from school or receiving ADHD treatment and suspension is associated with higher odds of delinquency, with 83 % and 96 % increase in the odds of delinquency increasing by one behavior, respectively. School punishment rate is not significant and there is no significant interaction between school punishment rates and individual experiences with suspension/ADHD treatment.

Model 3 in Table 2 includes interaction terms between individual suspension/ADHD categories and school special education enrollment rates. In this model, experiencing both ADHD treatment and school suspension is associated with about a 79 % in the odds of delinquency increasing by one behavior, compared to young people who do not experience ADHD treatment or suspension. A one-percentage point increase in special education enrollment rates is associated with a 2.02 % decrease in the odds of delinquency increasing by one behavior. There is a statistically significant interaction between school special education enrollment rates and our dummy variable for suspension only. Because we cannot use coefficients from interaction terms in non-linear models to determine whether relationships themselves are significant (Mize 2019; Mustillo, Lizardo, & McVeigh, 2018), we turn to two figures presented expected delinquency scores produced using marginal effects.

Fig. 1 presents expected delinquency scores (on the Y axis) by levels of school punishment rates (on the X axis) for students who experience neither ADHD treatment nor suspension, only ADHD treatment, only suspension, and both ADHD treatment and suspension. These estimates are based on Model 2 in Table 2. Predicted delinquency scores are relatively stable within category across levels of school punishment rates but vary significantly between excluded and non-excluded children. Though respondents who receive suspension only and respondents who receive both ADHD treatment and suspension have higher delinquency scores than those who receive neither or those who only receive ADHD treatment, the slopes of each line are relatively flat. Young people who receive neither ADHD treatment nor suspension and those who receive ADHD treatment only have similar predicted delinquency scores of about 0.7 and 0.8 at the lowest levels of school punishment rates and about 0.6 at the highest rates of school punishment. Those who experience suspension only have a predicted delinquency score of about 1.2 at the lowest and highest levels of school punishment rates. Respondents who receive both ADHD treatment and suspension have a predicted delinquency score of about 1.3 at the lowest and highest levels of school punishment rates.

Fig. 2 presents expected delinquency scores by levels of school special education enrollment rates. These estimates are based on Model 3 in Table 2. Again, respondents who receive suspension only and respondents who receive both ADHD treatment and suspension have higher delinquency scores than those who receive neither or those who only receive ADHD treatment. Notably, the slopes diverge for children who are never suspended or treated for ADHD compared to those who are only suspended as levels of school special education enrollment rates increase. The predicted delinquency score increases for youth who are only suspended as school special education enrollment rates increase. On the other hand, the predicted delinquency score decreases for young people who are never suspended and never receive ADHD treatment as school special education enrollment rates increase. However, results from Fig. 2 suggest that, although the difference is pronounced, there is no direct relationship between special education enrollment and delinquency for children who were neither suspended nor diagnosed with ADHD. Instead, it suggests the gap in delinquency between these children and suspended children is wider in schools with higher special education enrollment rates than in schools with lower special education

enrollment rates.

For young people who are never suspended and never treated for ADHD, the predicted delinquency score is about 0.8 at low levels of school special education rates, about 0.7 at middle levels of special education rates, and about 0.5 at high levels of school special education rates. Respondents who only experience suspension have a predicted delinquency score of about 1.0 at low levels of school special education rates, about 1.1 at middle levels, and about 1.3 at high levels of school special education enrollment rates. The difference in the predicted delinquency scores between these two groups is about 0.14 at the lowest level of school special education enrollment rates, but is about 0.82 at the highest levels of school special education enrollment rates. Predicted delinquency scores are more stable across levels of school special education enrollment rates for youth who just receive ADHD treatment and for those who experience both suspension and ADHD treatment. The predicted delinquency score for youth who only receive ADHD treatment is about 0.6 at low levels of school special education rates and about 0.8 at high levels of school special education rates. For those who receive both suspension and ADHD treatment, the predicted delinquency score is about 1.4 at low levels of school special education rates and about 1.3 at high levels of school special education enrollment rates.

5. Discussion and conclusion

In this study, we use public-use and restricted data from the Fragile Families and Child Well-Being Study and the U.S. Department of Education Civil Rights Data Collection to examine relationships between childhood experiences with suspension/ADHD treatment, school punishment and special education, and delinquency. Results reveal a direct relationship between school suspension and delinquency, even after controlling for prior behavior problems and several factors associated with delinquency. We find that delinquency scores are higher among suspended children and children receiving both suspension and ADHD treatment, compared to young people who experience neither or children who are only diagnosed with ADHD. However, children diagnosed with ADHD who are not suspended do not have significantly higher levels of delinquency than children who are neither suspended nor diagnosed with ADHD. Moreover, the relationship between individual childhood experiences with school suspension and/or ADHD treatment and delinquency is moderated by school special education climate.

Our first research question (RQ1) asked whether there were differences in delinquency levels across children with different experiences with school suspension and/or ADHD diagnoses. Our findings suggest that suspended children have higher odds of involvement in delinquency than non-suspended children, including non-suspended children diagnosed with ADHD. These findings suggest that suspension does not encourage suspended children to improve their behavior and learn to follow the rules (Bandura, 1986; Bear, 2012). Rather, our results are in line with prior research showing that suspension is a stigmatizing experience that leads to a process of labeling for suspended students, both by teachers (Ferguson, 2001; Lavin, 2016) and by peers (Ferguson, 2001; Jacobsen, 2020; Kupchik, 2010; Lavin, 2016). Prior literature finds that suspended children become aware of that label, which leads to declining self-esteem and negative attitudes towards school (Ferguson, 2001; Kim et al., 2010), and may facilitate adopting an antisocial identity that contributes to future delinquency (Ferguson, 2001; Pateroster & Iovanni, 1989; Way, 2012).

On the other hand, we find that children who experience only ADHD treatment do not have significantly different delinquency scores than young people who experience neither ADHD treatment nor suspension. Prior research suggests that children receiving therapy/ medication perform better in school and are less likely to be involved with the criminal justice system than suspended children (Ramey, 2016, 2020a; Lavin, 2016). Thus, this ADHD label may not carry stigma, at least not to the same degree as exclusion (Conrad, 1992; Heitzeg, 2016; Rosenfield,

1997; Zola, 1974). Our results are in line with work suggesting that labels associated with ADHD diagnoses are not as stigmatizing as those associated with school suspension, or that any negative labels associated with ADHD treatment are offset by benefits that accompany the treatment (Conrad, 2007; Hinshaw & Scheffler, 2014), such as managing symptoms of behavior problems (Barkley, 1997, 2002; Millichamp, 2010). Notably, this benefit does not extend to students who experience both exclusion and ADHD treatment. Any benefits of ADHD treatment are not enough to offset the negative effects of suspension for young people who experience both. Instead, children who receive both ADHD treatment and suspension have similar delinquency scores as children who are just suspended. These results mirror previous findings that suggest that children who are both punished and medicalized experience “double labelling” in which peers and authority figures single them out as noteworthy troublemakers, often unable or unwilling to comply with rules (Ramey, 2016, 2020a; Lavin, 2016).

Second, we generally find no direct association between school suspension rates (RQ2) or special education enrollment rates (RQ3) in predicting adolescent delinquency. Our findings suggest that, in this case, there does not seem to be a learning mechanism occurring in which schools' use of suspension or special education motivates students to comply with rules (Bandura, 1977, 1986). Though attending school in a high-suspension context has been associated with lower test scores (Craig & Martin, 2019; Perry & Morris, 2014) and higher delinquency (Way, 2012) for non-suspended students, we find that attending school in a higher-suspension context has a null relationship with delinquency, on average in this sample. Notably, this null relationship exists regardless of experiences with suspension or ADHD diagnoses, as school suspension rates do not moderate the relationships between suspension or ADHD diagnoses and delinquency (RQ4). Experiencing suspension predicts delinquency, but the predicted delinquency score is relatively constant across levels of school suspension rates. Thus, our results are in line with Wiley and colleagues (2020).

We speculate one reason for this finding may be that, although suspension experiences may differ across high and low suspension contexts, the nature of suspension in these contexts still leads to delinquency. For example, in low suspension contexts, suspended children may be singled out for their behavior problems by teachers and peers and marked as a troublemaker, disrupting social bonds with pro-social peers and increasing odds of delinquency (CITES). Alternatively, while suspended children may experience less stigma in high suspension contexts, there is little incentive for suspended children conforming to the rules in these settings (Kirk, 2009). Instead, their misbehavior may escalate if school punishments yield social rewards in highly punitive contexts (see Bell, 2019).

Finally, although special education enrollment rates do not directly influence delinquency, the relationship between suspension or ADHD diagnoses varies across schools with higher or lower special education enrollment rates (RQ5). Although marginal effects suggest this relationship is only marginally significant ($p < .10$), a higher special education enrollment rate contributes to especially low delinquency scores for non-suspended students who do not receive ADHD diagnoses. This may indicate that the resources that come with higher special education enrollment rates (e.g., personnel, behavior plans, etc.) may extend to children without formal ADHD diagnoses. However, in schools with high special education enrollment rates, suspended children without ADHD diagnoses have a higher predicted delinquency score than suspended children in schools with low rates of school special education enrollment and the delinquency gap between suspended and non-suspended children is much wider. This suggests that any benefits do not extend to all students in a way that may address the needs of all at-risk children. Instead, suspended children in schools with high special education enrollment may experience multiple forms of stigma, as they may be considered too troublesome or difficult to rehabilitate using school resources. As such, suspended children who are not diagnosed with ADHD may internalize negative messages about their behavior in

high special education contexts, leading to higher levels of delinquency.

Though informative, there are several limitations to the analyses. First, the sample is only generalizable to marginalized families in large urban settings. This is particularly important for ADHD treatment, which is significantly higher in advantaged families (Simoni & Drentea, 2016) and in suburban areas (Hinshaw & Scheffler, 2014). Nevertheless, we argue that children represented in the sample present a unique at-risk subset of kids that can stand to benefit greatly from possible interventions that do not involve strict punishment. Second, due to the Fragile Families sample design, we are unable to use multilevel modeling or other approaches that are better suited to the study of contextual effects. In doing so, we make a strong assumption that our families and children are representative of their specific schools. Finally, because we rely on self-reports of behavior and social control experiences, we risk misestimating true levels of delinquency and reports of punishment.

Our results provide several directions for policy and future research. First, more attention should be paid to how ADHD diagnosis and suspension affects kids in distinctive categories of these experiences differently. While schools are shifting from “one-size-fits-all” approaches to discipline, it is important not only those plans are crafted to meet the kids who have been identified as in need, but attention is paid to young people with behavioral needs who may slip through the cracks until it is too late. Second, attention should be paid to whether and how students are stigmatized as a result of school responses to misbehavior in order to try to reduce stigma. Our results suggest this focus is especially important for children who are suspended but not receiving ADHD treatment in schools with high special education enrollment rates. Third, though we include two potential moderators that connect social control experiences and delinquency, research needs to further clarify and identify direct and indirect pathways between the two experiences. Fourth, future research should consider whether gaps in delinquency between criminalized and medicalized children are truly because social control institutions (e.g., schools) socially construct the delinquent acts of medicalized children differently than criminalized children, or whether medicalized and criminalized children differ with respect to the types of crime and delinquency they engage in later in life. Finally, we recommend using special education and non-punitive restorative sanctions, rather than suspension, to address misbehavior in schools.

Overall, our study is among the first of which we are aware to analyze how categories of student suspension and ADHD treatment predict future delinquency, along with how school punishment and special education context moderates those relationships. Findings highlight the complex and interacting child and school punishment and special education experiences that students regularly navigate. Our results show that kids' school experiences with punishment and ADHD treatment are consequential for delinquency. School special education enrollment rates also matter, as this contextual factor moderates the relationship between punishment, ADHD treatment, and delinquency for certain groups of youth. The goal of exclusionary school discipline and ADHD treatment is to improve short- and long-term behavior and academic performance (Hinshaw & Scheffler, 2014; Kern et al., 2019; Lamont, 2013), but these strategies do not improve behavior for all children.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Table A1
Scales used in the current analyses.

| <i>Dependent Variables</i> | <i>Questions in scale</i> | <i>Where scale developed</i> | |
|--|--|---|-----------------|
| Self-Reported Delinquency, Wave 6 | Painted graffiti or signs on private property/public spaces; Deliberately damaged property that didn't belong to you; Taken something from a store without paying for it; Gotten into a serious physical fight; Hurt someone badly enough to need bandages or medical care; Driven a car without its owner's permission; Stolen something worth more than \$50; Gone into a house or building to steal something; Used or threaten to use a weapon to get something; Sold marijuana or other drugs; Stolen something worth less than \$50; Taken part in a group fight; Were you loud, rowdy, or unruly in a public place | Adopted from measures in the National Longitudinal Study of Adolescent Health (Add Health) Wave I and Wave II Home Visit interviews. | $\alpha = 0.73$ |
| Control Variables | | | |
| Peer Deviance, Wave 6 | Smoked an entire cigarette; Drank alcohol more than 2x without parents; Tried marijuana; Tried other drugs to get high; Ask to go drinking with them; Given or sold marijuana to you; Deliberately damaged property that did not belong to them; Stolen something worth more than \$50; Used or threaten to use a weapon to get something; Sold marijuana or other drugs; Stolen something worth less than \$50 | Adopted from measures in the National Longitudinal Study of Adolescent Health (Add Health) Wave I and Wave II Home Visit interviews. | $\alpha = 0.85$ |
| Self-Reported Self-Control, Wave 6 | I keep at my schoolwork until I am done with it; Once I make a plan to get something done, I stick to it; I finish whatever I begin; I am a hard worker; I understand others' feelings like when they are happy, sad, or mad; I try to comfort others when they are upset; I don't spend enough time thinking over a situation before I act; I often say and do things without considering the consequences; The plans I make don't work out because I haven't gone over them; I often make up my mind without taking the time to consider; I often say whatever comes into my head without thinking first; I often get into trouble because I don't think before I act; Youth is cruel, bullies, or shows meanness to others; Youth destroys things belonging to family or others; Youth is disobedient at home; Youth has temper tantrums or a hot temper; Youth is impulsive or acts without thinking; Youth doesn't seem to feel guilty after misbehaving; Youth hangs around with others who get in trouble; Youth lies or cheats | Express Subscale of the Adaptive Social Behavioral Inventory; Positive Adolescent Functioning (EPOCH) subscales; Dickman Dysfunctional Impulsivity Scale (Dickman, 1990); Achenbach Child Behavior Checklist | $\alpha = 0.81$ |
| Self-Reported Externalizing Behaviors, Wave 5 | Seven-item scale based on children's responses to questions regarding the following behaviors: I often argue with other kids; It's hard for me to pay attention; I get distracted easily; It's hard for me to finish my schoolwork; I get in trouble for talking and disturbing others; I get in trouble for fighting with other kids; I get in trouble for talking and disturbing others. | Achenbach Child Behavior Checklist | $\alpha = 0.76$ |
| Self-Reported Delinquency, Wave 5 | Purposely damaged or destroyed property; Taken or stolen something; Taken money at home; Cheated on a school test; Had a fist fight with another person; Hurt an animal on purpose; Gone into somebody's garden/yard/house/garage when not supposed to; Ran away from home; Skipped school without an excuse; Secretly taken a sip of wine, beer, or liquor; Smoked marijuana, grass, pot, weed; Smoked a cigarette or used tobacco; Been suspended or expelled from school; Written things or sprayed paint on walls or sidewalks or cars; Purposely set fire to building, car, or other or tried to do so; Avoided paying for things such as movies, bus, subway, or food; Thrown rocks or bottles at people or cars | Adopted from the Things You Have Done Scale, (Maumary-Gremaud, 2000) | $\alpha = 0.72$ |
| Maternal Self-Control, Wave 3 | Often say what comes into my head without thinking; Often, I don't think enough before I act; Often say/do things without considering consequences; Often get in trouble because I don't think before I act; Plans don't work out because I don't go over them carefully; Make my mind without considering situation from all angles | An Abbreviated form of Dickman Dysfunctional Impulsivity Scale (Dickman, 1990) | $\alpha = 0.83$ |
| Caregiver-Reported Neighborhood Disorder, Wave 6 | Number of families on block known well; Neighbors would get involved if children skip school and hang out on street; Neighbors would get involved if children spray paint buildings with graffiti; Neighbors would get involved if children show disrespect to an adult; Neighbors would get involved if fight broke out in front of house/building; Neighbors would get involved if fire station was threatened and budget cut; People around here are willing to help their neighbors; This is a close-knit neighborhood; People in this neighborhood generally don't get along with each other; People in this neighborhood do not share the same values; Gangs are a problem in this neighborhood | Modeled after measures developed by Sampson, Raudenbush, and Earls and used in the Project on Human Development in Chicago Neighborhoods (PHDCN): Community Involvement and Collective Efficacy, Wave 3 Primary Caregiver (PC) and Young Adult (SP) Questionnaires. | $\alpha = 0.86$ |

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Appendix A

(see Table A1).

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