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Executive Summary

Chronic absenteeism, an extreme form of absenteeism that is conventionally defined as missing ten percent or more of the school year, is alarmingly high and damaging the academic performance of our nation's students. But, obscured in aggregate, national analyses is the extremely high absenteeism among students with disabilities (SWDs), particularly compared to students not receiving special education services (GENs). Particularly troubling is the dearth of research into the patterns of absences for SWDs and GENs who attend school together in urban school systems, given relatively higher absenteeism when compared to suburban and rural districts. This study begins to close that gap, providing a rich descriptive exploration of chronic absenteeism in New York City (NYC), the nation's largest school district. We begin by addressing the following question:

Research Question 1: Is chronic absenteeism higher among SWDs than GENs in NYC, a large urban district? Are these patterns robust to controlling for differences in student characteristics and disabilities?

The answers will inform policymakers as they consider how to develop and target absence-reduction programs. Specifically, understanding the SWD-GEN chronic absenteeism disparity situates the magnitude of the problem, and since SWDs are a diverse group of students, disaggregating them to identify whether – and which – SWDs are at greater risk may be particularly helpful.

Our second step is to investigate potential correlations with observed disparities, focusing on the classroom setting. In particular, for students who attend schools educating SWDs and GENs (i.e. traditional schools), we believe it is important to explore if there are differences by the classroom setting in which SWDs are educated. We thus explore whether the SWD-GEN

absenteeism gap is larger when SWDs are educated in "GEN-majority" versus "SWD-majority" classrooms (i.e., in classrooms where the majority of students are GENs or SWDs, respectively). We are especially motivated to examine the classroom context because of the repeated emphasis in reauthorizations of the Individuals with Disabilities Education Act (IDEA) requiring the inclusion of SWDs in the general education environment to the maximum extent possible. This increasing integration of SWDs and GENs suggests attention should be paid to measuring the association between GEN- and SWD-majority classrooms and absenteeism. Thus, our second research question is:

Research Question 2: Does the size of the SWD-GEN absenteeism gap differ for SWDs who are educated in GEN-majority or SWD-majority classrooms? How do these patterns differ by disability?

NYC provides an excellent setting for the study. NYC educates more SWDs in more schools than any other US district, permitting in-depth study for a variety of fine-grained SWD classifications and assigned services. Many school districts struggle with how to educate SWDs to the highest standards. Results of this study will be valuable to practitioners and policymakers in school districts and to researchers seeking to understand whether disparities are large and to focus attention where gaps may be particularly significant.

Method

Our analytic sample consists of GENs and SWDs in grades 1-6 who attended a traditional NYC public school for at least two consecutive academic years between 2006-07 and 2011-12. Our final analytic sample includes 653,736 unique students across 37,867 classrooms, and 1,148 public elementary schools.

Outcome. Our key dependent variable is a binary measure that takes a value of one if the student meets the criteria for chronic absenteeism, defined as missing at least 10% of the instructional days in a single academic year (Balfanz & Byrnes, 2012).

SWDs. In our data, SWDs are identified as having an official Individualized Education Program (IEP) on record with the school district. Such detailed district data also provide IDEA-designated disability classifications. We group the 13 IDEA disability classifications into the five largest groups: Emotional Disturbance (ED, 4.8% of SWDs in the analytic sample), Learning Disability (LD, 39.9%), Speech Impairment (SI, 41.7%), Other Health Impairment (OH, 8.3%), and Low Incidence disabilities (LI, 5.3%).

Assigned Service and Classroom Setting. Each SWD's IEP includes a primary assigned service, which is the service provided for the largest proportion of time during the school day. NYC Department of Education classifies all four types of services in a continuum from least to most restrictive. We can classify SWDs receiving one of the three less restrictive services as being in GEN-majority classrooms. It is also possible to further divide GEN-majority classrooms into full-time or part-time.

Analytic Strategy

Our baseline model is as follows:

$$Y_{igst} = \beta_0 + \delta SWD_{igst} + \theta_g + \tau_t + \varepsilon_{igst}$$

where Y_{igst} is a dichotomous variable that takes a value of 1 if student *i* is chronically absent in grade *g,* school s, and year *t*, and 0 otherwise; SWD_{igst} takes a value of 1 if student *i* has an IEP in grade *g,* school s, and year *t,* and 0 otherwise; θ_g and τ_t are indicators for grade and school year. ε_{igst} is an error term and standard errors are clustered at the school level. Our key coefficient, δ, provides an estimate of the difference in probability of exhibiting chronic absenteeism between

SWDs and GENs. While this provides an unadjusted, baseline estimate of the difference in probability of exhibiting chronic absenteeism, we next explore a model that includes demographic controls, following by including school fixed effects, and finally classroom fixed effects. next explore whether there is heterogeneity in chronic absenteeism by SWD classifications described above.

Finally, we analyze the association between classroom setting and chronic absenteeism. We estimate two versions of this model, first distinguishing GEN-majority classrooms from SWD-majority classrooms, and further subdividing GEN-majority classrooms into full-time (ICT) and part-time (RS and SETSS). We explore these settings by disability category, as well.

Results

Baseline Results

In the baseline model, SWDs are 5.7 percentage points more likely to be chronically absent compared to their GEN peers. Controlling for student characteristics tempers the results: SWDs are more likely to be chronically absent, but the magnitude of the disparity is somewhat lower. School-to-school differences do not explain much of the variation in the rates of chronic absenteeism between SWDs and GENs, but variation across classrooms is more significant, where SWDs are now only 3.3 percentage points more likely to be chronically absent.

The baseline estimates show that students with EDs are more than 19 percentage points more likely to be chronically absent compared to GENs, and students with LDs and SIs are 8.1 and 2.0 percentage points more likely, respectively. The magnitude of each estimate is tempered as we add student controls and school and classroom effects to the specification.

Classroom Setting

Overall, GENs are the least likely to be chronically, followed by SWDs in GEN-majority classrooms, and finally SWDs in SWD-majority classrooms are the most absent. We further examine GEN-majority classrooms into full- and part-time services, and we continue to see that SWDs in SWD-majority classrooms exhibit the highest rates of chronic absenteeism. This is followed by SWDs receiving full-time services in GEN-majority classrooms, and that is followed by SWDs receiving part-time services in GEN-majority classrooms. GENs continues to be the least likely to be chronically absent.

In SWD-majority classrooms, EDs are followed, in the order of their likelihood of being chronically absent, by the groups LIs, OHs, LDs, and SIs. Next, we turn to the SWD-GEN gap for SWDs in GEN-majority classrooms. EDs in those classrooms are the most likely to be chronically absent than GENs in those rooms, but the gap is much lower than in SWD-majority classrooms. Next are LDs, OHs, and LIs (in that order), who are all still more likely to be chronically absent compared to their GEN counterparts. All of the students in these groups, however, are less likely to be chronically absent than students in the same disability groups in SWD-majority classrooms.

Discussion

Since our findings suggest that a SWD-GEN gap varies across disability categories, we urge that further attention be paid to the possibility that aggregate student data has obscured important heterogeneity. That is, aggregate attendance rates, such as school daily averages, mask critical detail about who is most at risk of missing school. Even the ‘SWD’ category itself may be too broad to detect heterogeneity in absenteeism. Without further details, the profile of which students are absent in school is too coarse to guide practice and develop supports.

Second, this study provides new descriptive evidence regarding one important school practice through which chronic absenteeism gaps between and among SWDs and GENs might be reduced. The SWD-GEN gap was smaller for SWDs in a classroom composed of majority of GEN classmates. Thus, this new evidence provides insight into how school structures themselves might be related to absenteeism.

Finally, our results suggest that additional attention and supports are needed to address the disproportionally high rates of chronic absenteeism faced by students with EDs. While our study suggests that the patterns of absences for students with EDs mirror patterns for other SWDs in the study (i.e., students in part-time classrooms are the least likely to be chronically absent), students with EDs are still missing the largest amount of school regardless of classroom setting. Therefore, our findings call for the need to conduct additional research to identify why more school is missed by students with EDs, across all classroom settings.

Showing Up: Disparities in Chronic Absenteeism between Students with and without Disabilities*

School absenteeism has moved into the spotlight as a national concern. Recent estimates suggest that 5-7.5 million students miss at least one cumulative month of school each year (Balfanz & Byrnes, 2012), representing ten to fifteen percent of all K-12 students in the U.S. and approximately 150-225 million days of lost instruction. Missing school cripples students' own achievement and social development (Gershenson, Jacknowitz, & Brannegan, 2016; Goodman, 2014; Gottfried, 2014; Gottfried & Kirksey, 2017) and also produces negative spillover effects, hurting classmates' test scores (Gottfried, 2011). Moreover absenteeism affects financial resources of schools and districts in states using attendance to allocate financial resources. For example, in the 2014-2015 academic year, California school districts experienced $1 billion in forgone dollars as a result of daily absences (Harris, 2016).

Chronic absenteeism, an extreme form of absenteeism that is conventionally defined as missing ten percent or more of the school year, is alarmingly high. According to Chang and Davis (2015), approximately 10% of early elementary school students miss more than a month of school. Using data from the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99, Romero and Lee (2007) estimate that more than 11% of kindergartners are chronically absent, with the rate falling slowly through elementary grades. A larger group is regarded as "at-risk" for chronic absenteeism, missing the 10% cutoff for chronic absenteeism by one to six days. The at-risk group includes roughly 14% of kindergartners, 12% of first graders, 11% of third graders, and 10% of fifth graders (Romero & Lee, 2007.)

Obscured in the aggregate data is the extremely high absenteeism among students with disabilities (SWDs) Cortiella & Horowitz, (2014), for example, report that high school freshman

with disabilities accrued 50% more absences, on average, than students not receiving special education services (GENs). Among younger SWDs, the patterns are similar. Elementary-age SWDs are more than 50% more likely to be chronically absent than GENs (Civil Rights Data Collection, 2016). While absenteeism starts early for *all* students, it is particularly high among young SWDs.

We have little empirical research probing the SWD-GEN disparity in chronic absenteeism. Particularly troubling is the dearth of research into the patterns of absences for SWDs and GENs who attend school together in urban school systems, given relatively higher absenteeism when compared to suburban and rural districts (Nauer, Mader, Robinson, & Jacobs, 2014). This study begins to close that gap, providing a rich descriptive exploration of chronic absenteeism in New York City (NYC), the nation's largest school district. We begin by addressing the following question:

Research Question 1: Is chronic absenteeism higher among SWDs than GENs in NYC, a large urban district? Are these patterns robust to controlling for differences in student characteristics and disabilities?

The answers will inform policymakers as they consider how to develop and target absence-reduction programs. Specifically, understanding the SWD-GEN chronic absenteeism disparity situates the magnitude of the problem, and since SWDs are a diverse group of students, disaggregating them to identify whether – and which – SWDs are at greater risk may be particularly helpful.

Our second step is to investigate potential correlations with observed disparities, focusing on the classroom setting. While many claim SWDs are absent more than GENs strictly due to health reasons, Chang and Davis (2015) challenge this claim, arguing that school context and

school structures also matter. Thus, we look towards possible school-based patterns in absenteeism.[1] That is, we explore whether – and to what extent - schooling factors explain the size of the observed SWD-GEN chronic absenteeism gap.

In particular, for students who attend schools educating SWDs and GENs (i.e. traditional schools), we believe it is important to explore if there are differences by the classroom setting in which SWDs are educated. We thus explore whether the SWD-GEN absenteeism gap is larger when SWDs are educated in "GEN-majority" versus "SWD-majority" classrooms (i.e., in classrooms where the majority of students are GENs or SWDs, respectively).

The classroom environment is selected based on the educational goals and services prescribed within a SWD's Individualized Education Program (IEP), as described further on. Multiple considerations are weighed when determining if a SWD should be educated in a SWD-majority classroom, including the feasibility of providing services within a GEN-majority classroom, the potential for classroom disruption, influence on a teacher's ability to adequately meet the needs of other students in the classroom, as well as the necessity of curriculum modifications.

Given these considerations, SWDs in SWD-majority classrooms likely differ from SWDs in GEN-majority classrooms in ways that are not captured in our data by our variables on disability classification or demographic characteristics. It is also possible that these unobserved factors that correlate with provision of services in SWD-majority classrooms also correlate with greater chronic absenteeism. Limitations in our data make it difficult to rule out the possibility that observed disparities in chronic absenteeism are due to this selection process and we do not claim to do so in this research. As a result, these descriptive analyses will not tell us what causes

gaps, but they will nonetheless be informative about where to focus attention as trends in chronic absenteeism for SWDs across different classroom settings have yet to be documented.

We are especially motivated to examine the classroom context because of the repeated emphasis in reauthorizations of the Individuals with Disabilities Education Act (IDEA) requiring the inclusion of SWDs in the general education environment to the maximum extent possible. Furthermore, recent federal legislation, such as *Endrew F. v. Douglas County School District* from 2017, has moved the conversation forward not simply with regards to placement but also academic progress. In light of these momentous policy moves within the special education realm, national-level statistics confirms that indeed changes are occurring, namely that SWDs are educated alongside GENs in traditional schools more now than ever in the nation's history (U.S. Department of Education, 2007, 2015). The pattern in NYC reflects the national trend. For instance, between 2007 and 2011, the percentage of SWDs educated in SWD-majority classrooms declined nine percentage points while the percentage educated in GEN-majority classrooms increased correspondingly (Author, in press; New York City Student-Level Administrative Data). This increasing integration of SWDs and GENs suggests attention should be paid to measuring the association between GEN- and SWD-majority classrooms and absenteeism. Thus, our second research question is:

Research Question 2: Does the size of the SWD-GEN absenteeism gap differ for SWDs who are educated in GEN-majority or SWD-majority classrooms? How do these patterns differ by disability?

In sum, little to no research to date has documented the extent, or explored associations to, school factors that might be linked to gaps in chronic absenteeism between SWDs and GENs in traditional schools. More so, NYC provides an excellent setting for the study. NYC educates

more SWDs in more schools than any other US district, permitting in-depth study for a variety of fine-grained SWD classifications and assigned services. Many school districts struggle with how to educate SWDs to the highest standards. Results of this study will be valuable to practitioners and policymakers in school districts and to researchers seeking to understand whether disparities are large and to focus attention where gaps may be particularly significant.

Background

Why Examine Absenteeism?[2]

Students with more school absences have lower test scores and grades (Author, 2009, Dryfoos, 1990; Finn, 1993; Gershenson et al., 2016; Goodman, 2014), greater chances of dropping out of high school (Rumberger, 1995), and higher odds of future unemployment (Alexander, Entwisle, & Horsey, 1997; Broadhurst, Paton, & May-Chahal, 2005; Kane, 2006). Absenteeism has also been associated with higher propensity to use tobacco, alcohol, and other drugs (Hallfors et al., 2002), and more behavioral problems, including social disengagement and alienation (Author, 2014; Johnson, 2005). Absences are also predictive of future absenteeism (Connolly & Olsen, 2012). Finally, students with more absences hurt their classmates' testing performance (Author, 2011a), indicating a negative spillover of absenteeism.

Why Analyze Association with GEN- versus SWD-Majority Classrooms?

In NYC – as in most districts – SWDs have been educated historically in either GEN-majority or SWD-majority classrooms (Rogers, 1993). GEN-majority classrooms are those where SWDs are taught alongside a significant proportion of GEN peers either with a single general education teacher or in conjunction with a special education teacher. In SWD-majority classrooms, SWDs are taught primarily with other SWDs, with a special education teacher, although to be clear, there are GEN students in these classrooms as well (they are simply not the

majority). Current federal law (i.e., IDEA) stipulates that SWDs are to be educated in SWD-majority classrooms only when the school determines that services provided in a GEN-majority classroom cannot address their needs (U.S. Department of Education, 2007, 2015).

Without any prior empirical or theoretical basis to link SWDs' classroom setting and absenteeism, we speculate that GEN-majority classrooms could hypothetically have a positive or a negative influence on absences. On the one hand, absences may be lower when SWDs share more educational experiences and spend more time with their GEN classmates. Spending more time with GENs may be associated with feelings of belonging among SWDs (Fitch, 1999; Freeman & Alkin, 2000; Schnorr, 1990), and feelings of belonging have ultimately been linked to fewer absences (Balfanz & Byrnes, 2012; Gottfried, 2014). These feelings also have been linked to higher levels of self-efficacy, engagement, and educational attainment (Anderman, 2002; Finn, 1989; Uwah, McMahon & Furlow, 2008), which in turn may reduce absenteeism.

On the other hand, in GEN-majority classrooms, there is the potential that SWDs may be more absent. First, because SWDs instruction alongside GEN classmates, SWDs may feel more singled-out within the classroom as they compare themselves to GENs who typically have higher academic performance levels and/or fewer behavioral issues (Freeman & Alkin, 2000). In making these comparisons, SWDs may not feel as though they belong in the classroom, thereby decreasing classroom engagement and ultimately increasing absences. Relatedly, given that lower school belonging may not be solely associated with declining classroom engagement but also with increased school refusal (Kearny et al., 2002). Increased school refusal has been linked to negative school-going attitudes (Tangey, Baumeister & Boone, 2004), and these negative attitudes have been associated with school avoidance – i.e., absenteeism (Ladd & Price, 1987). In

sum, lower school belonging may increase disengagement or may increase school refusal behaviors, both of which appear to be associated with higher levels of absenteeism.

Second, because some SWDs may sometimes have weaker social adjustment compared to GENs (Biordi & Nicholson, 2012; Pearl et al., 1998; Murray & Greenberg, 2001; Turner & Noh, 1988; Van Gundy & Schieman, 2001), there is the possibility that time spent in classrooms with more GENs may exacerbate these feelings. Indeed, Frostad & Pijl (2007) found that in GEN-majority classrooms, SWDs were less accepted and had fewer friendships. Under these circumstances, belonging declines and absences may be higher – potentially through educational disengagement or school refusal, as described above.

Why Analyze Differences by Disability?

SWDs are a heterogeneous group of students and the school factors hypothesized so far are general and may differ by disability – hence our motivation for examining not only the overall SWD sample of students but also disability subgroups. For instance, students with emotional or behavioral disabilities may feel less included among GENs, given potential disruptions (Coie, Dodge, & Kupersmidt, 1990; Siperstein & Leffert, 1997). Feeling less part of the classroom may be exacerbated when spending the entire school day included in all classroom activities rather than in SWD-majority classrooms (Kozleski & Jackson, 1993; Freeman & Alkin, 2000), hence lowering belonging and lowering educational engagement or increasing school refusal, as described above, and thereby increasing the potential for absenteeism. Hence, for many groups of SWDs, behavior plays a large role in the disability. It is possible that social and behavioral skills could be a factor of absenteeism, as moderated by SWD-majority or GEN-majority classroom setting.

To the contrary, students with learning disabilities have been shown to have much stronger academic performance when educated in GEN-majority classrooms, conditional on having appropriate educational supports within that classroom (Dexter, Park, & Hughes, 2011; Therrien, Taylor, Hosp, Kaldenberg, & Gorsh, 2011). This may increase feelings of engagement and belonging, as students with learning disabilities begin to thrive alongside GEN classmates and absences potentially decline. These are two of many examples of how the importance of the classroom setting may differ by specific disability, and thus the intersection of where classroom and disability type becomes especially important in this analysis.

Methods

Data Sources

We use longitudinal, student-level administrative data from the New York City Department of Education (NYCDOE) to analyze descriptively SWD-GEN chronic absenteeism gaps. The data include measures of race/ethnicity, gender, age, foreign-born status, limited English proficiency (LEP), free/reduced price lunch (FRPL) eligibility, grade level, classroom ID, and school ID. The dataset also includes the number of days each student was absent as well as the total number of school days each student was registered in the district. For SWDs, the data include indicators for the thirteen disability classifications defined under IDEA and a primary assigned special education service.

Our analytic sample consists of GENs and SWDs in grades 1-6 or ungraded[3] who attended a traditional NYC public school for at least two consecutive academic years between 2006-07 (2007) and 2011-12 (2012). We exclude students attending charter or alternative schools, SWDs without a disability classification or who are educated in a non-NYCDOE facility, as well as schools with fewer than five SWDs, enrollment below 25 students, or schools

serving only SWDs. On average, schools educating only SWDs (called District 75 schools in NYC) educate 13.4% of SWDs between 2007 and 2012, but do not educate any GENs, and thus are excluded given that our analyses compare SWDs and GENs sharing schools or classrooms. Table A1 in the Appendix shows the rates of chronic absenteeism and numbers of students for District 75. Our final analytic sample includes 653,736 unique students across 37,867 classrooms, and 1,148 public elementary schools. Across all years, this amounts to 2,312,219 student-year observations.

Measures

Outcome. Our key dependent variable is a binary measure that takes a value of one if the student meets the criteria for chronic absenteeism, defined as missing at least 10% of the instructional days in a single academic year (Balfanz & Byrnes, 2012). To be specific, we measure the absenteeism rate as one minus the attendance rate, calculated by dividing the total number of days a student was present in the school year by the number of days he or she was registered to be in school (i.e., this accounts for students starting the year late or leaving the district before the end of the school year). Note that in our sensitivity analyses, we estimate models using several different cutoffs as well as a continuous measure of absenteeism.

SWDs. In our data, SWDs are identified as having an official Individualized Education Program (IEP) on record with the NYCDOE.[4] In the analyses to follow, a student with an IEP on file was coded as binary (1, being yes; 0, being no) in each academic year.

Such detailed district data also provide IDEA-designated disability classifications. We group the 13 IDEA disability classifications into the five largest groups: Emotional Disturbance (ED, 4.8% of SWDs in the analytic sample), Learning Disability (LD, 39.9%), Speech Impairment (SI, 41.7%), Other Health Impairment (OH, 8.3%), and Low Incidence disabilities

(LI, 5.3%). The NYCDOE describes the disability classifications as follows (2016): an ED is a disability with one or more of the following characteristics: an inability to learn that cannot be explained by intellectual, sensory, or health factors; an inability to build satisfactory interpersonal relationships; inappropriate types of behaviors under normal circumstances; and/or pervasive mood of unhappiness or depression. An LD is a disability in one or more psychological processes involved in understanding or using language, which results in an imperfect ability to speak, think, write, spell, or do math calculations. An SI is a speech impediment or communication disorder. An OH includes limited strength or alertness to environmental stimuli that results in a limited alertness to the educational environment. Lastly, the LI category includes the remaining nine disabilities[5] as a single classification due to their relatively low incidence compared to the other groups.

Assigned Service and Classroom Setting

Each SWD's IEP includes a primary assigned service, which is the service provided for the largest proportion of time during the school day. NYCDOE classifies all services in a continuum from "least to most restrictive" (NYCDOE*,* n.d.). The least restrictive, Related Services (RS, 13.4% of SWDs in the analytic sample), includes support services such as counseling, hearing services, physical therapy, and speech/language therapy.[6] Special Education Teacher Support Services (SETSS, 26.4%) encompass supplemental instruction that helps SWDs remain in the general education classroom.[7] Integrated Co-Teaching (ICT, 25.9%) is a service through which GENs and SWDs are educated by both a general and special education teacher in a classroom in which at most 40% of students are SWDs. Self-Contained (SC, 34.3%) services are provided to SWDs with similar needs in SWD-majority classrooms.

SWDs receiving one of the three less restrictive services (RS, SETSS, or ICT) were coded as 1 for being educated in a GEN-majority classroom. SWDs receiving SC were coded as 0, meaning that they were in a SWD-majority classroom. Note that GENs are taught alongside SWDs receiving all four types of services; a higher percentage of GENs were taught alongside SWDs receiving RS, SETTS, and ICT, and a higher percentage of SWDs were taught alongside SWDs receiving SC.

Full-time versus part-time classroom setting. It is also possible to further divide GEN-majority classrooms into full-time (ICT services provided) or part-time (RS and SETSS services provided). The full- and part-time designations are determined by the district as the proportion of a school day a SWD spends with a certified special education teacher (the remaining time is spent with a general education teacher). For example, SWDs whose primary assigned service is ICT are always in the classroom as a special education teacher, hence are receiving full-time services in GEN-majority classrooms. But as noted before, ICT classrooms contain both SWDs and GENs who are always co-taught by general and special education teachers. Conversely, SWDs assigned RS and SETSS are services in GEN-majority classrooms that are not always in contact with a special education teacher. SWDs in these classrooms receive either in-class or pull-out services, thus only part-time instruction from a special education teacher. SWDs with SCs are receiving full-time services.

Analytic Strategy

Our baseline model is as follows:

$$Y_{igst} = \beta_0 + \delta SWD_{igst} + \theta_g + \tau_t + \varepsilon_{igst} \quad (1)$$

where Y_{igst} is a dichotomous variable that takes a value of 1 if student *i* is chronically absent in grade *g,* school s, and year *t*, and 0 otherwise; SWD_{igst} takes a value of 1 if student *i* has an IEP in

grade *g,* school s, and year *t,* and 0 otherwise; θ_g and τ_t are indicators for grade and school year, respectively, and are included to control for grade and year specific absenteeism differences. ε_{igst} is an error term and standard errors are clustered at the school level in order to correct for potential correlations in the errors among students attending the same school. Our key coefficient, δ, provides an estimate of the difference in probability of exhibiting chronic absenteeism between SWDs and GENs.

While equation (1) provides an unadjusted, baseline estimate of the difference in probability of exhibiting chronic absenteeism, we next explore a model that includes demographic controls:

$$Y_{igst} = \beta_0 + \delta SWD_{igst} + X'_{igst}\beta + \theta_g + \tau_t + \varepsilon_{igst} \quad (2)$$

Here X'_{igst} represents a set of student characteristics (gender, race/ethnicity, age, native born, LEP, and FRPL).

Finally, because our sample includes students across many schools and classrooms, we include school or classroom fixed effects in our models, with the final model as follows:

$$Y_{igst} = \beta_0 + \delta SWD_{igst} + X'_{igst}\beta + \theta_g + \tau_t + \varphi + \varepsilon_{igst} \quad (3)$$

φ is either the school or classroom effect, and all other variables are the same as in equation (2).[8] Including school fixed effects helps control for school-to-school differences. For example, our estimate of δ might be low, for instance, if a school leader is highly invested in ensuring SWDs receive appropriate supports and services as well as committed to addressing chronic absenteeism.

A similar story might be told within schools and between classrooms. That is, some teachers might be more effective than others in addressing the needs of SWDs as well as

addressing chronic absenteeism. Alternatively, a principal may have placed all highly-attending students together in a classroom. Therefore, rather than comparing SWDs and GENs within an entire grade in a school, classroom effects allow us to compare students within the same classrooms. Because ordinary least squares (OLS) results are easy to interpret, we present models estimated with OLS, although qualitatively similar results are obtained using logit (available from authors).

Heterogeneity by disability classification. We next explore whether there is heterogeneity in chronic absenteeism by SWD classifications described above:

$$Y_{igst} = \beta_0 + \delta_1 ED_{igst} + \delta_2 LD_{igst} + \delta_3 SI_{igst} + \delta_4 OH_{igst} + \delta_5 LI_{igst} + X'_{igst}\beta + \theta_g + \tau_t + \varphi + \varepsilon_{igst} \quad (4)$$

In this model, ED_{igst} takes on a value of 1 if a student has been classified as an ED in grade *g,* school s, and year t, and 0 otherwise. LD_{igst}, SI_{igst}, OH_{igst}, and LI_{igst} are defined similarly and all other variables are as previously defined. The coefficients on each disability group (δ_1 through δ_5) capture differences between these groups and GENs.

Classroom setting. Finally, we analyze the association between classroom setting and chronic absenteeism. We estimate two versions of this model, first distinguishing GEN-majority classrooms (with SWDs receiving RS, ICT, or SETSS) from SWD-majority classrooms (with SWDs receiving SC), and further subdividing GEN-majority classrooms into full-time (ICT) and part-time (RS and SETSS). The two models are as follows:

$$Y_{igst} = \beta_0 + \delta_1 Z_{igst} + \delta_2 Z_{igst} * GENmajor_{igst} + X'_{igst}\beta + \theta_g + \tau_t + \varphi + \varepsilon_{igst} \quad (5)$$

$$Y_{igst} = \beta_0 + \delta_1 Z_{igst} + \delta_2 Z_{igst} * GENmajorFT_{igst} + \delta_3 Z_{igst} * GENmajorPT_{igst} + X'_{igst}\beta + \theta_g + \tau_t + \varphi + \varepsilon_{igst} \quad (6)$$

Z_{igst} represents either SWD_{igst} or the complete set of disability classifications described above, depending on if we are analyzing the SWD group aggregately or by disability category.

GENmajor, *GENmajorFT*, and *GENmajorPT* equal 1 for SWDs educated in GEN-majority classrooms, full-time, and part-time, respectively, and 0 otherwise. All other variables are as above. Even after all these controls and fixed effects, however, there is likely some selection into classroom types. Nonetheless, having minimized this to the extent possible, if we find large disparities that remain, they are likely to be ones that policy, practice, and future research should address.

Sensitivity analyses. We explore the sensitivity of our results in three dimensions.

Defining chronic absenteeism. The definition of chronic absenteeism is set at 10%. While analysts and federal policy makers have adopted this cutoff, there has been no discussion of whether deviations from this cutoff, or even a measure of continuous absenteeism, would yield different results. Thus, we re-estimate our models using several different cutoffs for chronic absenteeism, as well as a continuous absence rate as the dependent variable.

Excluding sixth grade. Prior research has consistently shown that the incidence of chronic absenteeism is highest among younger elementary students, declines as students progress through elementary school, and spikes as children move to new middle schools (Balfanz & Byrnes 2012). Thus, to ensure that the resurgence of chronic absenteeism for sixth grade students is not driving results for the entire analysis, we exclude sixth graders from the analytic sample and re-estimate the models.

Higher- versus lower-poverty schools. Prior literature provides evidence that the incidence of absenteeism is higher in urban, high-poverty school districts (Nauer et al., 2014). Furthermore, absenteeism is unevenly distributed across students in cities, with at-risk students exhibiting higher rates (Balfanz & Byrnes, 2012). To investigate if the rate of chronic absenteeism in higher-poverty schools is driving our results, we re-estimate our models after

limiting the analytic sample to include only the "lowest-poverty" or "highest-poverty" quintile of schools in the school district. These schools were identified based on the percentage of students within a school who are eligible for free or reduced price lunches. For each of these analyses, we show results for our specification including grade and year effects, student controls, and classroom fixed effects.

Results

Descriptive Statistics

Table 1 panel A shows descriptive statistics for all students and by chronic absenteeism status. SWDs represent 16.5% of the analytic sample, reflecting a just-slightly higher percentage than national rates in 2013-14, where approximately 14% of all public school students received special education services (Children and Youth with Disabilities, 2016).[9] As shown in columns 2 and 3, students who are chronically absent differ from those who are not. Those who are chronically absent are disproportionately SWD, male, Hispanic, Black, native born, and FRPL, and younger.

[Insert Table 1 About here]

In panel B, comparing across rows reveals that the incidence of chronic absenteeism is more than 11 percentage points higher for SWDs than for GENs – with more than 29% of SWDs and almost 18% of GENs chronically absent. In the rows describing services, chronic absenteeism is lowest among students receiving RS (16.9%), and highest among SC students (39.9%). In rows showing classroom settings, rates are lower for SWDs educated in GEN-majority (23.5%) compared to SWD-majority classrooms (39.9%).[10] As for disability types, students with EDs (47.1%) are the most and students with SIs (24.3%) are the least likely to be chronically absent. Finally, the incidence of chronic absenteeism is highest in earlier grades, with

a peak of 23.4% in first grade. The rate of chronic absenteeism steadily declines through grade five, rising slightly in sixth grade.[11]

It is possible that students in GEN-majority classrooms could differ from students in SWD-majority classrooms, even within specific disability categories. Such differences would make descriptive results less useful than if there were fewer differences. To explore this, for SWDs in each disability classification as well as for GENs, we examined partial correlations between being in GEN-majority classrooms and observable characteristics displayed in the first column of Table 2. Partial correlations were purposefully chosen, as they take into account the joint influence of all other variables. As seen in Table 2, there are only small correlation coefficients between being in GEN-majority classrooms and the set of characteristics. The sizes of the correlation coefficients in Table 2 suggest that there is little evidence pointing to a systematic pattern of SWDs being educated in GEN-majority classrooms based on our observable characteristics.

Importantly, this table includes previous year's reading and math scores as well as chronic absenteeism. Even for these performance variables, the partial correlation coefficients with being in GEN-majority classrooms remain fairly weak. Thus, while this study is designed to provide rich descriptive evidence on patterns of SWD chronic absenteeism, finding that there are not large relationships between classroom types and observable characteristics makes results more informative.

[Insert Table 2 about here]

Recall also that GENs share classrooms with SWDs even in SWD-majority classrooms. One might be concerned that these GENs are really "SWDs-to-be," just not yet identified as such by their schools. To address this, we examine our sample of GENs and regress an indicator of

being classified as SWD in year *t+1* on being in a SWD-majority classroom in year *t* (as well as observable individual characteristics and school, grade, and year controls). The coefficients in this model are small, with probabilities less than 1% (results available from authors). In fact, overall, the probability of a GEN being classified as a SWD in year *t+1,* conditional on being in a SWD-majority classroom, is only 0.5%. Thus, our analysis does not support that GENs in SWD-majority classrooms are simply not yet identified as SWD.

Baseline Results

Table 3 presents estimates of the relationship between chronic absenteeism for SWDs compared to GENs in traditional schools. In panel A, the first column presents estimates for the baseline model: SWDs are 5.7 percentage points more likely to be chronically absent compared to their GEN peers. Estimates for equations 2 and 3 are provided in columns 2-4, beginning with inclusion of student controls and then adding school or classroom fixed effects in progressive columns. Controlling for student characteristics tempers the results: SWDs are more likely to be chronically absent, but the magnitude of the disparity is somewhat lower. School-to-school differences do not explain much of the variation in the rates of chronic absenteeism between SWDs and GENs, as shown in column 3 when school effects are added, but variation across classrooms is more significant, as seen in column 4, where SWDs are now only 3.3 percentage points more likely to be chronically absent. Regardless of the specification, SWDs are consistently more likely to be chronically absent compared to GENs, and all estimates are statistically significant at the 1% level.

[Insert Table 3 about here]

Heterogeneity by Disability Classification

Table 3 panel B presents the models with the *SWD* variable disaggregated into the five largest disability groups. The baseline estimates show that students with EDs are more than 19 percentage points more likely to be chronically absent compared to GENs, and students with LDs and SIs are 8.1 and 2.0 percentage points more likely, respectively. Given the large population of students with LDs (39.9% of all SWDs) and with SIs (41.7%) in the analytic sample, the results in panel A are driven by their sheer numbers and do not represent the heterogeneity among SWDs. The magnitude of each estimate is tempered as we add student controls and school and classroom effects to the specification. EDs continue to have the highest likelihood of exhibiting chronic absenteeism, with probabilities 13.2 percentage points above GENs in the most complete model with classroom effects, and with LDs, the largest group of SWDs, 6.0 percentage points above GENs. Overall, except for the SI result in the final column (0.8 percentage points lower than GENs), SWDs continue to have higher probabilities of exhibiting chronic absenteeism compared to GENs.

Classroom Setting

The results in Table 3 contribute to our understanding of the incidence of chronic absenteeism, showing that it varies among SWDs and is particularly high among the ED group. Simply confirming a disparity, however, is less useful for policymakers who wish to understand if there are associations between existing school settings and gaps in chronic absenteeism. In order to delve more deeply, we analyze the association between being educated in GEN-majority and SWD-majority classrooms and chronic absenteeism. Table 4 reports these associations for SWDs in GEN-majority and SWD-majority classrooms (column 1), as well as by full-time and part-time GEN-majority classrooms (columns 2), compared to GENs. We present within-classroom results only, as they are similar to within-school results.

[Insert Table 4 about here]

Starting with columns 1, note that the SWD-GEN gap in chronic absenteeism for SWDs in SWD-majority classrooms is captured by the coefficient in the first row (on *SWD*), and the SWD-GEN gap in chronic absenteeism for SWDs in GEN-majority classrooms is captured by the sum of the coefficient in the first row (on *SWD*) plus the coefficient in the second row (on *SWD GENmajor*). Column 1 shows that SWDs in SWD-majority classrooms are 14.0 percentage points more likely to be chronically absent than GENs, while SWDs in GEN-majority classrooms are only 3.1 percentage points more likely to be chronically absent compared to GENs (14.0–10.9 = 3.1). Overall, GENs are the least likely to be chronically absent regardless of their classroom setting, followed by SWDs in GEN-majority classrooms, and finally SWDs in SWD-majority classrooms are the most absent.

We further disaggregate the indicator for GEN-majority classrooms into full- and part-time services in column 2. In this column, we continue to see that SWDs in SWD-majority classrooms exhibit the highest rates of chronic absenteeism (14.1 percentage points in column 2). This is followed by SWDs receiving full-time services in GEN-majority classrooms (5.3 percentage points, 14.1–8.8), and that is followed by SWDs receiving part-time services in GEN-majority classrooms (1.8 percentage points, 14.1–12.3). GENs continues to be the least likely to be chronically absent.

The results in Table 5 are presented exactly as those in Table 4, except that SWDs are disaggregated into disability groups. The coefficients on variables *ED, LD, SI, OH*, and *LI* (first five rows) represent each of the different types of SWDs in SWD-majority classrooms. The first row of the table shows that EDs remain the most at-risk group of all SWDs: in SWD-majority classrooms, EDs are the most likely to be chronically absent of any type of student (over 23

percentage points). In SWD-majority classrooms, EDs are followed, in the order of their likelihood of being chronically absent, by the groups LIs, OHs, LDs, and SIs. All groups show high rates, never less than nine percentage points above GENs.

[Insert Table 5 about here]

Next, we turn to the SWD-GEN gap for SWDs in GEN-majority classrooms. EDs in those classrooms are 10.7 percentage points (23.2–12.5) more likely to be chronically absent than GENs in those rooms. This stands in stark comparison to the 23.2 percentage point gap for EDs in SWD-majority classrooms, as discussed in the previous paragraph. Next are LDs, OHs, and LIs (in that order), who are all still more likely to be chronically absent compared to their GEN counterparts. All of the students in these groups, however, are less likely to be chronically absent than students in the same disability groups in SWD-majority classrooms. SIs in GEN-majority classrooms are the only subgroup of SWDs, compared to GENs, who are slightly less likely to be chronically absent than GENs (1.1 percentage points less likely).

Disaggregating GEN-majority classrooms into full- and part-time receipt of services (column 2) reveals even more heterogeneity in chronic absenteeism for SWDs. As before, any SWD group in a GEN-majority classroom is less likely to be chronically absent compared to students in the same disability group in a SWD-majority classroom. In addition, SWDs receiving part-time services in GEN-majority classrooms are less likely to be chronically absent compared to students classified with a similar disability and receiving full-time services in GEN-majority classrooms. For example, compared to GENs, EDs receiving part-time services are only 8.8 percentage points more likely to be chronically absent, 13.5 percentage points for EDs receiving full-time services, through this is much lower than 23.4 for EDs in SWD-majority classrooms. SIs in part-time services in GEN-majority classrooms are the only subgroup of SWDs less likely

to be chronically absent compared to GENs (-2.3 percentage points). SIs receiving full-time services in GEN-majority classrooms are still more likely to be chronically absent compared to GENs (1.1 percentage points).

Sensitivity Analyses

We re-estimate the within-classroom analysis, presented in Table 6 (including grade and year effects, student controls, and classroom fixed effects), for each of the previously mentioned robustness tests. The first three columns of Table 6 include new definitions of chronic absenteeism as the dependent variable: two different chronic absence rate cutoffs and a continuous measure (defined on a 0-1 scale, where 0 implies a student has perfect attendance).[12] The final three columns incorporate alterations to the analytic sample: keeping only grades one through five, the lowest-poverty quintile of schools, or the highest-poverty quintile of schools.

[Insert Table 6 about here]

We would expect all SWDs to be more (less) likely to be chronically absent, compared to GENs, if the threshold was reduced (increased). The estimates in the first two columns of Table 6 (where chronic absenteeism is redefined with 9 and 11% cutoffs) reflect this intuition, although the coefficients are not statistically different from the original estimates using a 10% cutoff (Table 5 column 2); thus, our results are not sensitive to small changes in the cutoff determining which students are chronically absent. In column 3, when we use a continuous measure of absenteeism, our results again are similar to previous estimates. For example, in panel B, column 3, EDs in SWD-majority classrooms are 4.9 percentage points more absent than GENs, but those in part-time GEN-majority classrooms are less absent than those in SWD-majority classrooms.

Our results are also insensitive to each modification of the analytic sample. None of the estimates in the final three columns of Table 6 are statistically different from those in the final

column of Table 5. This would imply that the incidence of chronic absenteeism among SWDs, compared to GENs, is independent of grade included in the analyses as well as of relative level of poverty among students in the same school.

Overall, the results in Table 6 directly reflect what has already been found in Table 5: EDs are the most at-risk group of SWDs, SWDs receiving part-time services in GEN-majority classrooms are less likely to be chronically absent compared to students diagnosed with a similar disability and receiving full-time services in GEN-majority classrooms, and SWDs receiving full-time services in GEN-majority classrooms are less likely to be chronically absent compared to students diagnosed with a similar disability but in SWD-majority classrooms.

Discussion

Past research shows that absenteeism is linked to lower academic performance and weakened social and behavioral outcomes, on average. Before this study, however, little was known about SWD-GEN disparities in missing school, particularly in urban districts where the rates of missing school are higher across all students. Moreover, the changing landscape of special education policy is increasingly placing SWDs in GEN-majority classrooms, but we do not know how the classroom setting is associated with absenteeism.

This study helps address these research gaps. We explored detailed patterns in student-level, longitudinal data including information on chronic absenteeism for all students, distinguishing disability classifications and indicating types of classrooms in which they were educated. Notably, these data represented entire cohorts of elementary school children in NYC – the nation's largest school district.

We draw several key implications. First, overall SWD-GEN chronic absenteeism patterns in NYC reflect national trends. In line with national estimates, NYC SWDs are 65.6% more

likely to be chronically absent than GENs. But, disaggregating by disability reveals considerable heterogeneity. Students with EDs miss a tremendous amount of school compared to other SWDs and as compared to GENs, and students with LDs, the largest group of SWDs, miss a considerable amount as well.

Second, SWDs in GEN-majority classrooms were less likely to be chronically absent than those in SWD-majority classrooms. Disaggregating GEN-majority classrooms into receiving full- and part-time services shows SWDs receiving part-time services in GEN-majority classrooms were less likely to be chronically absent compared to SWDs receiving full-time services in GEN-majority classrooms. Regardless of full- or part-time, however, students diagnosed with an ED remain the most at-risk to be absent, across all models in our analysis.

These findings have several implications for future policy, practice, and research. First, since our findings suggest that a SWD-GEN gap varies across disability categories, we urge that further attention be paid to the possibility that aggregate student data has obscured important heterogeneity. That is, aggregate attendance rates, such as school daily averages, mask critical detail about who is most at risk of missing school. Even the 'SWD' category itself may be too broad to detect heterogeneity in absenteeism. Without further details, the profile of which students are absent in school is too coarse to guide practice and develop supports.

Second, this study provides new descriptive evidence regarding one important school practice through which chronic absenteeism gaps between and among SWDs and GENs might be reduced. The SWD-GEN gap was smaller for SWDs in a classroom composed of majority of GEN classmates. Thus, this new evidence provides insight into how school structures themselves might be related to absenteeism, as proposed by Chang and Davis (2015). There are several reasons to hypothesize that SWDs in GEN-majority classrooms might have lower absences. For

instance, in more traditional classrooms settings, some SWDs have increased feelings of belonging with their teachers. Linking this to the results of this present study, it has been shown that as belonging increases, school engagement follows or school refusal declines, which in turn is linked to a decline in chronic absenteeism. In large urban systems, like NYC, where schools educate hundreds of thousands of students each year, feeling and being included might be especially salient for those with unique needs. Hence, this is one plausible explanation for the patterns found in this study, which merit further exploration.

The first and second implications point to a third when we consider heterogeneity by disability type. Our results suggest that additional attention and supports are needed to address the disproportionally high rates of chronic absenteeism faced by students with EDs. While our study suggests that the patterns of absences for students with EDs mirror patterns for other SWDs in the study (i.e., students in part-time classrooms are the least likely to be chronically absent), students with EDs are still missing the largest amount of school regardless of classroom setting. Therefore, our findings call for the need to conduct additional research to identify why more school is missed by students with EDs, across all classroom settings.

Finally, on a broader level, as the nationwide trend of providing SWDs with more education in GEN-majority classrooms continues to press forward, our study shows that there are non-achievement outcomes to consider for such settings. In this case, increasingly heterogeneous settings are associated with fewer absences for SWDs. Thus, while accountability policies tend to focus on testing outcomes, our study shows that measuring student success can encompass non-academic measures, like attendance. And while school attendance, among other non-achievement outcomes, are not the primary focus of IDEA, our findings point to how some school structures might be beneficial to some students at risk.

Limitations

There are limitations with this study that can guide future research. These findings highlight the need to conduct additional research to identify what factors within the school setting might *cause* SWDs, and more importantly students with EDs, to miss more school. While many biases are eliminated by controls in our models, still selection on unobserved variables into GEN-majority and SWD-majority classrooms probably remain. Thus, more quasi-experimental work would help to bolster the findings in this present study. The work conducted in this study also could be complemented with qualitative research, where the mechanisms particular to students with EDs could be elaborated. Third, this study cannot make conclusions about the efficacy of SWD- versus GEN-majority classroom settings with regards to academic proficiency and growth metrics, which are often used for school accountability. Additionally, this study does not examine the role of teacher qualifications. Future work might compare these findings with regards to academic performance as well as to teacher effectiveness. Finally, this study relied on information for a specific group of the public school population in the United States: elementary school children in NYC. Even with our highly detailed student-level, longitudinal dataset, future research might corroborate our findings using detailed data from other districts or entire states. In this way, we can continue building a portrait of absenteeism, risk factors, and supports for SWDs.

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Table 1: Descriptive Statistics: Analytic Sample of GENs and SWDs, grades 1-6, NYC Traditional* Public Schools, 2007-2012

		All	Chronic	Not Chronic
Panel A (column percents)				
ALL STUDENTS[13]	GEN	83.53	75.59	85.50
	SWD	16.47	24.63	14.50
	Female	48.92	47.11	49.36
	Hispanic	40.66	48.25	38.82
	Black	28.41	36.74	26.40
	White	15.28	9.76	16.61
	Asian/Other	15.65	5.25	18.17
	Native Born	88.97	94.15	87.72
	FRPL	83.00	90.39	81.21
	LEP	15.23	12.99	15.78
	Age (years)	9.26	9.23	9.26
ALL SWDs[13]	RS	13.35	7.74	15.65
	SETSS	26.39	22.24	28.10
	ICT	25.94	23.02	27.15
	SC	34.32	47.01	29.10
	GEN-Majority	65.68	53.00	70.90
	SWD-Majority	34.32	47.01	29.10
	ED	4.82	7.78	3.60
	LD	39.94	43.23	38.59
	SI	41.72	34.78	44.58
	OH	8.26	7.93	8.39
	LI	5.26	6.28	4.84
Panel B (row percents)				
ALL STUDENTS[13]	ALL		19.51	80.49
	GEN		17.60	82.40
	SWD		29.16	70.84
ALL SWDs[13]	RS		16.91	83.09
	SETSS		24.57	75.43
	ICT		25.87	74.13
	SC		39.94	60.06
	GEN-Majority		23.53	76.47
	SWD-Majority		39.94	60.06
	ED		47.07	52.93
	LD		31.56	68.44
	SI		24.31	75.69
	OH		28.02	71.98
	LI		34.81	65.19
GRADE[13]	1		23.38	76.62
	2		19.35	80.65
	3		17.02	82.98
	4		16.08	83.92
	5		16.08	83.92
	6		18.63	81.37
	95		39.72	60.28
	S-Y Obs.	2,321,344	452,774	1,868,570
	N-students	653,737	214,426	594,432
	N-schools	1,273	1,143	1,270
	N-classrooms	37,992	32,628	32,495

Table 2: Partial Correlation Coefficients between Students in GEN-Majority Classrooms and Other Characteristics, grades 1–6, NYC Traditional Public Schools, 2007-2012

	ED	LD	SI	OH	LI	GEN
Female	0.01	0.03	-0.01	0.00	0.02	0.10
Hispanic	-0.13	-0.05	-0.03	-0.07	-0.01	0.04
Black	-0.15	-0.12	-0.09	-0.15	-0.09	0.05
Asian/Other	-0.01	0.01	0.02	0.00	0.02	0.05
Age	0.05	0.05	0.03	0.03	0.04	-0.06
Native Born	0.02	0.02	0.00	0.01	-0.02	-0.07
FRPL	-0.03	-0.03	-0.01	-0.05	0.00	0.02
LEP	-0.07	-0.12	-0.13	-0.12	-0.16	-0.06
Lag Z-Math	-0.15	-0.15	-0.18	-0.11	-0.06	0.08
Lag Z-Read	0.03	0.05	0.04	0.04	0.18	0.13
Chronic	-0.18	-0.11	-0.13	-0.12	-0.13	-0.04

Notes: Each column represents the partial correlation between the indicator for a student being in a GEN-majority classroom for the sample listed at the top of the column and a given row characteristic, controlling for all other row characteristics. The *Lag Z-Read* and *Lag Z-Math* variables represent a student's prior year's standardized reading and math scores.

Table 3: Chronic Absenteeism, SWD and SWD classification

DV: Chronic	(1)	(2)	(3)	(4)
Panel A				
SWD	0.057***	0.044***	0.045***	0.033***
	(0.002)	(0.002)	(0.001)	(0.001)
Age	0.040***	0.034***	0.029***	0.043***
	(0.001)	(0.001)	(0.001)	(0.001)
Female		-0.004***	-0.003***	-0.001
		(0.001)	(0.001)	(0.001)
Black		0.088***	0.015***	0.007*
		(0.004)	(0.003)	(0.003)
Hispanic		0.078***	0.031***	0.027***
		(0.004)	(0.003)	(0.003)
Asian/Other		-0.058***	-0.053***	-0.053***
		(0.003)	(0.003)	(0.003)
Native Born		0.060***	0.058***	0.060***
		(0.003)	(0.003)	(0.003)
FRPL		0.074***	0.048***	0.045***
		(0.002)	(0.002)	(0.002)
LEP		-0.047***	-0.046***	-0.044***
		(0.003)	(0.002)	(0.002)
constant	-0.258***	-0.337***	-0.219***	-0.300***
	(0.012)	(0.012)	(0.011)	(0.023)
Student Controls	N	Y	Y	Y
School FE	N	N	Y	N
Classroom FE	N	N	N	Y
N	2,321,219	2,321,219	2,321,219	2,321,219
Panel B				
ED	0.191***	0.158***	0.144***	0.132***
	(0.006)	(0.005)	(0.005)	(0.005)
LD	0.081***	0.068***	0.070***	0.060***
	(0.002)	(0.002)	(0.002)	(0.002)
SI	0.020***	0.006***	0.007***	-0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
OH	0.067***	0.065***	0.067***	0.054***
	(0.005)	(0.004)	(0.004)	(0.003)
LI	0.080***	0.083***	0.086***	0.058***
	(0.007)	(0.006)	(0.007)	(0.006)
constant	-0.231***	-0.311***	-0.194***	-0.282***
	(0.012)	(0.012)	(0.011)	(0.023)
Student Controls	N	Y	Y	Y
School FE	N	N	Y	N
Classroom FE	N	N	N	Y
N	2,321,219	2,321,219	2,321,219	2,321,219

Standard errors are in parentheses and clustered at the school level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: All models include grade and year effects. Student controls for gender, race, age, foreign-born status, LEP, and FRPL, are included in models 2, 3, and 4.

Table 4: Chronic Absenteeism and Assigned Services

DV: Chronic	(1)	(2)
SWD	0.140***	0.141***
	(0.006)	(0.006)
SWD GENmajor	-0.109***	
	(0.006)	
SWD GENmajor Full Time		-0.088***
		(0.006)
SWD GENmajor Part Time		-0.123***
		(0.006)
constant	-0.300***	0.150***
	(0.023)	(0.024)
Student Controls	Y	Y
School FE	N	N
Classroom FE	Y	Y
N	2,321,219	2,321,219

Standard errors are in parentheses and clustered at the school level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Notes: All models include grade and year effects, as well as student controls for gender, race, age, foreign-born status, LEP, and FRPL.

Table 5: Chronic Absenteeism, Disability Classification and Assigned Services

DV: Chronic	(1)	(2)
ED	0.232***	0.234***
	(0.008)	(0.008)
LD	0.141***	0.143***
	(0.006)	(0.006)
SI	0.090***	0.092***
	(0.006)	(0.006)
OH	0.155***	0.157***
	(0.009)	(0.009)
LI	0.167***	0.170***
	(0.009)	(0.009)
ED GENmajor	-0.125***	
	(0.010)	
LD GENmajor	-0.079***	
	(0.006)	
SI GENmajor	-0.101***	
	(0.006)	
OH GENmajor	-0.105***	
	(0.009)	
LI GENmajor	-0.127***	
	(0.011)	
ED GENmajor Full Time		-0.099***
		(0.013)
ED GENmajor Part Time		-0.146***
		(0.012)
LD GENmajor Full Time		-0.055***
		(0.007)
LD GENmajor Part Time		-0.094***
		(0.006)
SI GENmajor Full Time		-0.081***
		(0.007)
SI GENmajor Part Time		-0.115***
		(0.007)
OH GENmajor Full Time		-0.087***
		(0.010)
OH GENmajor Part Time		-0.116***
		(0.010)
LI GENmajor Full Time		-0.123***
		(0.016)
LI GENmajor Part Time		-0.131***
		(0.012)
Student Controls	Y	Y
School FE	N	N
Classroom FE	Y	Y
N	2,321,219	2,321,219

Standard errors in parentheses and clustered at the school level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Notes*: All models include grade and year effects, as well as student controls for gender, race, age, foreign-born status, LEP, and FRPL.

Table 6: Sensitivity Checks

DV: Chronic	(9%)	(11%)	(Continuous)	(No 6th)	(Top 20%)	(Bottom 20%)
Panel A						
ED	0.242***	0.226***	0.049***	0.228***	0.233***	0.250***
	(0.008)	(0.008)	(0.002)	(0.008)	(0.009)	(0.055)
LD	0.151***	0.136***	0.028***	0.140***	0.135***	0.188***
	(0.006)	(0.006)	(0.001)	(0.007)	(0.007)	(0.037)
SI	0.101***	0.084***	0.018***	0.087***	0.088***	0.119***
	(0.007)	(0.006)	(0.001)	(0.007)	(0.007)	(0.039)
OH	0.170***	0.146***	0.031***	0.151***	0.159***	0.181***
	(0.009)	(0.009)	(0.002)	(0.009)	(0.011)	(0.056)
LI	0.184***	0.158***	0.034***	0.165***	0.169***	0.204***
	(0.010)	(0.009)	(0.002)	(0.010)	(0.011)	(0.061)
ED GENmajor	-0.132***	-0.125***	-0.027***	-0.127***	-0.123***	-0.174***
	(0.011)	(0.010)	(0.002)	(0.011)	(0.013)	(0.065)
LD GENmajor	-0.082***	-0.081***	-0.017***	-0.073***	-0.075***	-0.135***
	(0.006)	(0.006)	(0.001)	(0.007)	(0.007)	(0.039)
SI GENmajor	-0.111***	-0.095***	-0.020***	-0.097***	-0.106***	-0.125***
	(0.007)	(0.006)	(0.001)	(0.007)	(0.008)	(0.037)
OH GENmajor	-0.114***	-0.099***	-0.021***	-0.101***	-0.095***	-0.154***
	(0.010)	(0.009)	(0.002)	(0.010)	(0.012)	(0.058)
LI GENmajor	-0.140***	-0.125***	-0.025***	-0.126***	-0.127***	-0.102
	(0.012)	(0.011)	(0.002)	(0.012)	(0.015)	(0.063)
Student Controls	Y	Y	Y	Y	Y	Y
Classroom FE	Y	Y	Y	Y	Y	Y
N	2,321,219	2,321,219	2,321,219	2,021,854	1,528,767	76,173
Panel B						
ED	0.244***	0.228***	0.049***	0.230***	0.235***	0.254***
	(0.008)	(0.008)	(0.002)	(0.008)	(0.009)	(0.054)
LD	0.154***	0.137***	0.028***	0.142***	0.137***	0.191***
	(0.006)	(0.006)	(0.001)	(0.007)	(0.007)	(0.037)
SI	0.103***	0.086***	0.018***	0.089***	0.091***	0.122***
	(0.007)	(0.006)	(0.001)	(0.007)	(0.007)	(0.038)
OH	0.172***	0.148***	0.031***	0.153***	0.161***	0.184***
	(0.009)	(0.009)	(0.002)	(0.009)	(0.011)	(0.056)
LI	0.186***	0.160***	0.035***	0.167***	0.171***	0.208***
	(0.010)	(0.009)	(0.002)	(0.010)	(0.011)	(0.061)
ED GENmajor Full Time	-0.107***	-0.099***	-0.023***	-0.101***	-0.100***	-0.113
	(0.014)	(0.013)	(0.003)	(0.015)	(0.017)	(0.073)
ED GENmajor Part Time	-0.153***	-0.145***	-0.030***	-0.147***	-0.141***	-0.264***
	(0.012)	(0.012)	(0.002)	(0.013)	(0.015)	(0.076)
LD GENmajor Full Time	-0.055***	-0.058***	-0.012***	-0.048***	-0.048***	-0.124***
	(0.007)	(0.006)	(0.001)	(0.007)	(0.008)	(0.040)
LD GENmajor Part Time	-0.099***	-0.095***	-0.020***	-0.088***	-0.091***	-0.145***
	(0.007)	(0.006)	(0.001)	(0.007)	(0.008)	(0.040)
SI GENmajor Full Time	-0.088***	-0.077***	-0.016***	-0.076***	-0.083***	-0.107***
	(0.007)	(0.007)	(0.001)	(0.007)	(0.008)	(0.038)
SI GENmajor Part Time	-0.126***	-0.108***	-0.023***	-0.110***	-0.121***	-0.140***
	(0.007)	(0.007)	(0.001)	(0.007)	(0.008)	(0.036)
OH GENmajor Full Time	-0.095***	-0.081***	-0.017***	-0.080***	-0.079***	-0.131**
	(0.011)	(0.010)	(0.002)	(0.011)	(0.013)	(0.056)
OH GENmajor Part Time	-0.125***	-0.109***	-0.023***	-0.113***	-0.105***	-0.172***
	(0.010)	(0.010)	(0.002)	(0.010)	(0.012)	(0.059)
LI GENmajor Full Time	-0.136***	-0.122***	-0.024***	-0.124***	-0.131***	-0.104
	(0.017)	(0.015)	(0.003)	(0.017)	(0.023)	(0.069)
LI GENmajor Part Time	-0.144***	-0.129***	-0.026***	-0.128***	-0.125***	-0.104
	(0.012)	(0.011)	(0.002)	(0.013)	(0.015)	(0.065)
Student Controls	Y	Y	Y	Y	Y	Y
Classroom FE	Y	Y	Y	Y	Y	Y
N	2,321,219	2,321,219	2,321,219	2,021,854	1,528,767	76,173

Standard errors in parentheses and clustered at the school level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: All models include grade and year effects; as well as student controls for gender, race, age, foreign-born status, LEP, and FRPL.

APPENDIX

Table A1: Descriptive Statistics: SWDs Educated in District 75 2007-2012

		All	Chronic	Not Chronic
Panel A (column percents)				
ALL D75 STUDENTS[14]	Female	25.70	27.18	23.97
	Hispanic	35.75	40.70	30.00
	Black	44.72	44.24	45.27
	White	13.25	10.13	16.88
	Asian/Other	6.28	04.93	7.85
	Native Born	94.51	94.68	94.33
	FRPL	77.82	79.90	75.40
	LEP	10.05	9.91	10.21
	Age (years)	9.58	9.65	9.52
	ED	30.96	37.49	23.44
	LD	4.15	5.21	2.92
	SI	2.11	1.36	2.98
	OH	2.73	2.39	3.12
	LI	60.05	53.54	67.54
Panel B (row percents)				
ALL D75 STUDENTS[13]	ALL		53.79	46.21
	ED		64.79	35.21
	LD		67.26	32.74
	SI		34.49	65.51
	OH		46.87	53.13
	LI		47.71	52.29
	S-Y Obs.	137,305	73,860	63,445
	N-students	40,880	30,147	23,007
	N-schools	66	66	66

Footnotes

*This work has been funded by a research grant from the Spencer Foundation.

[1] Note that blaming health for missing school is also a common misunderstanding for GEN students as well. Recent findings suggest that the majority of elementary school students who reported being sick as a reason for being absent were indeed not sick at all (Kerr et al., 2011).

[2] Chronic absenteeism is an extreme form of absenteeism and as of August 2017, fourteen of the seventeen states that had submitted their ESSA plans to the federal government had used it or absenteeism as one indicator of school performance. Research, however, is more prevalent on effects of absenteeism in general, and thus we review the general absenteeism literature here.

[3] Students are coded ungraded if they are eligible to participate in the New York State Alternate Assessment (NYSAA) or ineligible for NYSAA and their instructional level is significantly below (three or more years) the grade-level coursework in English language arts (ELA) and mathematics of their GEN peers (*The Data Specialist's Guide for New York City Schools,* 2008).

[4] IEPs are required for each student identified with a disability under federal legislation.

[5] These disabilities include autism, deaf-blindness, deafness, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, traumatic brain injury, and visual impairment. Other authors have also combined low incidence classifications in order to achieve analytically manageable subgroups. See, for example, Shogren, Kennedy, Dowsett, & Little (2014).

[6] More specifically: counseling, school health services, hearing education services, occupational therapy, physical therapy, speech/language therapy, vision education services, orientation and mobility services, and "other support" services. A student's primary assigned service is designated RS if it is the only service provided by the district.

[7] SETSS are provided at a minimum of three hours a week and a maximum of 50% of the school day. The special education teacher can provide instruction directly (to a single individual or a group no larger than eight SWDs) or indirectly (in collaboration with the student's general education teacher).

[8] Recall that our sample is elementary school students, who remain most, if not all, of the day together in the same classroom.

[9] When D75 students are included, the percent of SWDs is 17.6.

[10] Recall that these classroom settings are defined as follows: SWDs receiving one of the three less restrictive services (RS, SETSS, or ICT) were coded as 1 for being educated in a GEN-majority classroom and SWDs receiving SC were coded as 0, meaning that they were in a SWD-majority classroom.

[11] Note that first through fifth graders are in one classroom the majority of the day, while some sixth graders may change classes (although usually as a group). In our sensitivity analysis, we remove sixth graders from the sample and find that results so not change.

[12] We show only two results (9% and 11%), although the results were also tested at 5% and 15%. All cutoffs give similar results.

[13] 6-year averages across all student-year observations.

[14] 7-year averages across all student-year observations.