

Investigating Arts Education Effects on School Engagement and Climate

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Abstract

There is a renewed focus on what constitutes a well-rounded education, as well as a growing interest in broader indicators of educational success, including social and emotional development and school engagement. However, identifying educational practices that improve such outcomes has proven elusive. We explore the role of arts education on a broad range of educational outcomes using administrative and survey data from Boston's public schools. We find that students receiving the arts in school attend more, are more engaged, and their parents and teachers are more likely to participate and be engaged at school, with larger effects for students with individualized education plans, students with lower standardized test scores, and students with a history of chronic absenteeism. These findings call attention to the pivotal role of the arts in providing students with socially and emotionally supportive learning environments that enhance relationships between students and schools.

Keywords

arts education, school engagement, school climate

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Introduction

Education theorists contend that learning is both a social and emotional endeavor and that students develop socially and emotionally in contexts that provide active learning through direct engagement with the world and opportunities to reflect on those experiences (Dewey, 1954; Farrington et al., 2019; Nagaoka et al., 2015). Learning through and about the arts can provide these kinds of educational opportunities (Eisner, 1992; Ladson-Billings, 1994). By providing socially and emotionally supportive learning environments, schools develop trusting relationships with students that may improve their sense of engagement, belonging, safety, and support. Improvements along these dimensions may have spillover effects on other educational outcomes, such as academic achievement measured through test scores (Allensworth et al., 2018; Berkowitz et al., 2017; Bryk & Schneider, 2002; Coleman et al., 1982; Deasy, 2002; Farrington et al., 2019; Fiske, 1999; Wang & Holcombe, 2010). However, despite strong theoretical underpinnings, there is limited empirical evidence that demonstrates a causal relationship between school arts learning opportunities and outcomes related to social and emotional learning.

In this study, we conduct a longitudinal investigation of arts course-taking impacts on student engagement and school climate for students enrolled in Boston Public Schools (BPS) using student-level administrative and school-level survey data from 2008-2009 through 2018-2019. Our data provide us with a sample of 496,236 student-level observations enrolled in 169 traditional public schools over eleven school years. These data allow us to investigate within-student and -school variations in arts education course-taking over time and the impacts on school engagement and school climate. Though not primary learning objectives of arts education, we also investigate whether arts course-taking affects students' standardized English language arts (ELA) and math achievement to examine potential spillover benefits. Our analytic approach leverages the timing of student-level arts course-taking in models that control for student and school fixed effects, eliminating many potential threats to the internal validity of our estimates.

We find that when students are enrolled in arts courses, their average daily attendance, an indicator of school engagement, modestly improves by 0.2 of a percentage point, or roughly one-third of a day in a standard 180-day school year. This effect translates into nine additional days of instruction for a class of 25 students. The positive effect on attendance is also reflected in a half of a percentage point decrease in the likelihood that a student is chronically absent. These attendance effects may appear small but are substantial when compared to effects of recent interventions designed for

mitigating truancy (e.g., Guryan et al., 2021; Riccio et al., 2013; Robinson et al., 2018; Smythe-Leistico & Page, 2018). Arts course enrollment also slightly increases student suspension rates, though these effects are not practically significant. We do not find significant positive or negative effects with our full student sample on ELA or math test score achievement. This finding contradicts the accountability-driven intuition that cutting arts learning opportunities can boost math and reading achievement.

The positive effect on average daily attendance is robust across each student subgroup we examine. However, these positive effects are consistently larger for students with individualized education plans (IEPs), students with lower standardized test scores, and students with a history of chronic absenteeism. These students experience positive attendance effects that translate to 0.7, 0.9, and 1.1 of an additional day of attendance, and decreases in the likelihood of being chronically absent by 0.9%, 1.4%, and 1.3% points, respectively.

Using school-level survey data, we find that increases in the percent of students enrolled in arts courses improves students' learning engagement, their assessments of teachers' engagement, and teachers' assessments of student-school engagement, parent-school engagement, and sense of respect from students and parents. A 20%-point increase in the proportion of students taking arts courses significantly improves students' self-assessed learning engagement by 0.01 of a standard deviation and their assessments of teachers' engagement by 0.03 of a standard deviation. Such an increase in students taking arts courses improves teachers' perceptions of students' and parents' school engagement by 0.05 and 0.04 of a standard deviation, respectively, and positively affects their sense of respect from students and parents by 0.02 of a standard deviation. While these effects are small in magnitude, they are consistent with and strengthen the broader theoretical claim that arts education has positive effects on school engagement.

These findings have important policy implications for the role that arts education plays in improving school engagement and climate. They are also critical for developing an empirical body of evidence to inform policy decisions regarding the provision and allocation of arts educational resources and opportunities. The more pronounced effects for students with IEPs, lower test scores, and a history of chronic absenteeism suggests these learning experiences are especially pivotal for students who are most likely otherwise disengaged with school. As policymakers and school administrators have come to recognize school engagement and climate as essential education objectives, these findings call attention to the pivotal role of the arts in providing students with socially and emotionally supportive learning environments that enhance relationships between students and schools.

Background

The arts have intrinsic educational value, but policymakers have come to increasingly rely on measurable and research-supported outcomes in their decision-making (Slavin, 2002). This reliance has resulted in school administrators' intensified focus on state-assessed educational outcomes, particularly standardized tests, which has coincided with significant reductions in the arts and other non-tested subject areas (Bassok et al., 2016; Dee et al., 2013; Farkas Duffett Research Group, 2012; Gadsden, 2008; Murnane & Papay, 2010; West, 2007; Yee, 2014). Broader recognition that arts learning is good for its own sake, in addition to states' adopting outcome measures better aligned with arts learning, may provide a policy climate more conducive to the preservation of arts education. However, few states and districts currently include arts education measures in their accountability systems, and rigorous scientific-based empirical investigations of arts education are rare (Bowen & Kisida, 2017; Elpus, 2013; Ludwig et al., 2017; Wan et al., 2018; Winner et al., 2013). Consequently, scientific-based arts educational investigations are crucial to understanding the scope of their benefits within the current education policy climate.

Researchers have investigated relationships between the arts and commonly measured educational outcomes, such as math and reading standardized test scores, school dropout, and college enrollment (Catterall et al., 2012; Elpus, 2013). However, these studies generally fail to address omitted variable bias concerns, leaving questions about the magnitude and causality of observed relationships (Winner & Cooper, 2000; Winner et al., 2013). Moreover, there is a theoretical disconnect between assessing arts impacts in terms of commonly measured educational outcomes, as opposed to outcomes more closely aligned with the objectives of arts education (McCarthy et al., 2004).

The American Academy of Arts and Sciences (2021) Commission on the Arts took stock of the many theories and claims surrounding arts education and identified seven areas of educational benefits that are supported by theory and research. There is the primary claim that learning about the arts is good for its own sake. The arts are a fundamental mode of human expression and provide a "way of knowing and understanding the world" (American Academy of Arts & Sciences, 2021, p. 11). The Commission's (2021) report identifies six other thematic benefits that are not directly tied to measures of arts content and skills but are linked to the process of learning through and about the arts (McCarthy et al., 2004). These benefits include positive impacts on students' understanding of other cultures and history, social-emotional development, prosocial/interpersonal skills, school engagement,

career-related exploration and skills, and community and civic engagement. Notably absent are claims that the arts directly affect student achievement in other tested subjects, though it remains plausible that spillover effects might occur as an indirect result of arts' influence on school engagement and enjoyment.

A small number of randomized controlled trial (RCT) studies have made advancements by shedding light on the causal impacts of arts learning and, in some instances, investigating outcomes that are more likely to be theoretically aligned with arts learning. These RCT studies have found that arts exposure through a museum's school partnership program improved students' critical thinking about works of art, historical empathy, tolerance, attitudes toward art, and desire to acquire cultural capital (Kisida et al., 2014; Kisida et al., 2016; Kisida et al., 2018). Similarly, students' attendance at live theater performances positively affects historical empathy, tolerance, and social perspective taking (Greene et al., 2018; Kisida et al., 2020). Arts integration positively impacts students' longer-term retention of science learning (Hardiman et al., 2014; Hardiman et al., 2019). Instrumental music participation leads to positive effects on students' self-control, behavior, executive functions, and ELA and math school grades (Alemán et al., 2017; Holochwost et al., 2017). Finally, substantial increases in schools' arts educational opportunities, provided through partnerships with arts organizations, improves students' discipline, writing achievement, and compassion for others (Bowen & Kisida, 2022).

These RCT studies have demonstrated that the arts have causal, positive impacts on a broad, diverse array of policy-relevant educational outcomes. However, there remain critical unanswered questions about the applicability of these findings to more common school settings and about the underlying mechanisms that lead to positive educational outcomes. Many of these studies have taken place in out-of-school settings and with arts education interventions that do not reflect more common, everyday K-12 arts learning experiences. Though the aforementioned studies have advanced the field by investigating outcomes more directly aligned with their arts interventions' objectives, these investigations have not directly addressed particular mechanisms that could explain how and why arts learning leads to a host of positive educational outcomes (Farrington et al., 2019).

The Arts and School Engagement and Climate

School climate is crucial to providing environments that cultivate and improve student engagement (Thapa et al., 2013; Wang & Degol, 2016).

When schools develop and maintain physically and emotionally safe settings, they provide climates conducive to community and relationship building (Coleman et al., 1982.; Lenzi et al., 2017; Skiba et al., 2004; Voight & Nation, 2016). Such climates improve students' school engagement, which hinges on students' sense of belonging, emotional security, competence, connection, and having agency in their learning (Bergin & Bergin, 2009; Connell & Wellborn, 1991; Fredricks et al., 2004; Pianta, 1999; Roorda et al., 2017; Ryan & Deci, 2009; Verschueren & Koomen, 2012).

Arts education provides opportunities for students to create, explore, reflect, express themselves, and actively engage in their learning experiences (Dewey, 1954; Farrington et al., 2019; Hetland et al., 2015). These experiences can simultaneously offer students opportunities for individual autonomy and interpersonal experiences with peers, teachers, and other members of the school-community (Barrett & Bond, 2015; Davis, 2009; Deasy, 2002; Farrington et al., 2019; McCammon et al., 2012). Consequently, arts educational opportunities may increase students' school engagement and improve school climate.

Though theoretically intuitive, few studies have directly investigated the relationship between arts education course-taking and school engagement and climate. Catterall et al. (2012) found correlations between arts course-taking and educational attainment. Thomas et al. (2015) conducted a survival analysis with Texas's 2009 high school-graduating cohort and found that arts course participation significantly reduces the likelihood of a student dropping out of school. Finally, Bowen and Kisida (2022) conducted an RCT study that found increases in school arts educational opportunities reduced student disciplinary infractions for middle school students, and improved school engagement and college aspirations for elementary school students. This evidence is promising and supports the theory that the arts positively affect student engagement and school climate, but none of these prior studies have attempted to estimate causal effects with a K-12 student population in common, authentic school settings over an extensive period of time.

Recent federal legislation provides opportunities for preserving and restoring arts education, but these opportunities call for evidence of causal links between students' arts learning and policy-relevant outcomes. The No Child Left Behind Act in 2002 gave the federal government greater influence over the design of state-level school accountability systems and resulted in math and reading test scores serving as the predominant measures of school performance (Manna, 2011; Portz & Beauchamp, 2022). A major shift occurred with the most recent reauthorization of the Elementary and Secondary Education Act, the Every Student Succeeds Act (2015), that

requires states to broaden their measures of school quality and effectiveness to rely less heavily on test scores (Batel, 2017; Jochim, 2017). As a result, most states now use measures of chronic absenteeism and graduation for school accountability; moreover, a handful of states have adopted accountability measures of school climate, student engagement or satisfaction, and discipline; and four states now hold schools accountable for whether students have access to arts instruction (Education Commission of the States, 2021; English, 2017; Portz & Beauchamp, 2022). Moreover, prior to the Every Student Succeeds Act, only four states had freestanding K-12 social and emotional learning competencies; by 2022, 27 states had adopted such competencies (Dermody & Dusenbury, 2022). These changes reflect a growing emphasis on broader student competencies and research demonstrating their importance (Jackson, 2018; Jackson et al., 2020; Kraft, 2019; Soland et al., 2013). Consequently, the vast majority of states have adopted measures that assess school engagement, school culture and climate, and/or social and emotional learning, and administrators and educators are seeking ways to strengthen these outcomes (Herman et al., 2017). Strong evidence that the arts affect these newly adopted measures of school quality and effectiveness would provide guidance to schools seeking to promote school engagement and climate and additional funding streams to support arts learning (Hale et al., 2017).

Sources of Arts Education Effect Heterogeneity

Studies have consistently shown that low-income students, students of color, and students with IEPs have fewer arts learning experiences and are more likely to rely on schools to provide these experiences (Elpus, 2013, 2022; Elpus & Abril, 2019; Gara & Winsler, 2020; Kisida et al., 2014; Meyer et al., 2004; Redford et al., 2018; Winsler et al., 2020). Many studies have also shown that students with less access demonstrate more-pronounced positive impacts from school-facilitated arts exposure, suggesting that these interventions reduce gaps in educational outcomes tied to arts-educational activities (Bowen & Kisida, 2022; Catterall et al., 2012; Kisida et al., 2014; Thomas et al., 2015; Kinney & Forsythe, 2005; Podlozny, 2000).

Arts learning opportunities and outcomes also vary substantially for students as they progress from elementary through secondary school grade levels. Elementary-level students, on average, receive more arts instructional time than secondary school-level students (Miksza, 2013; Parsad & Spiegelman, 2011). However, secondary schools offer greater variety, in terms of number of arts disciplines covered in their course offerings (Carey et al., 1995; Parsad & Spiegelman, 2011). Secondary students are more

likely to receive instruction from arts education specialists, while elementary students more often receive arts instruction from generalists (Parsad & Spiegelman, 2011; Sparks et al., 2015). Some studies have found substantial variations in arts educational impacts by student grade levels, suggesting that age/grade-level influences arts learning effects (e.g., Bowen et al., 2014; Bowen & Kisida, 2022).

We add to this growing body of research with a quasi-experimental investigation that examines the causal effects of arts course-taking on students' school engagement and climate. Past studies have shown that arts learning opportunities and their impacts tend to vary substantially according to students' prior arts experiences and opportunities as well as their age/grade level. Therefore, we also investigate whether arts course-taking produces heterogeneous effects across student subgroups. Such investigations are necessary for furthering our understanding of moderating influences between arts learning and educational outcomes.

Data and Measures

We use BPS student-level administrative data for students enrolled in grades 1 to 12 from the 2008-2009 through 2018-2019 school years. These administrative data include student course enrollments, student-level demographics, annual attendance, discipline records, and standardized test scores. We merge these student-level administrative data with BPS's student and teacher climate survey data collected over this same time period.

Our primary student-level independent variable of interest is an annual indicator of students' arts course-taking. This variable is constructed with student-level course records as a dichotomous variable indicating whether a student enrolled in at least one arts course during the school year. These administrative data provide the advantage of identifying the years and grade-levels when students are enrolled in arts courses, rather than relying on district-, school-, or grade-level schedules that tend to be less accurate. BPS arts course requirements were different by school level: elementary students are supposed to complete 90 hours of arts-related instruction each year; middle schoolers are supposed to complete three semesters of arts instruction over 3 years; and high school students are supposed to pass two semester courses in the arts (Boston Public Schools, 2022). Despite BPS's requirement that elementary-level students receive arts-related instruction each year, our data indicate that there was substantial variation in their arts course enrollment patterns.

Our data also provide student-level demographics that include BPS-identified grade level, gender, race/ethnicity, and indicators for whether a

student was from a household receiving government assistance (referred to as “economically disadvantaged”), participating in an English language learner (ELL) program, or receiving an IEP.

Our dependent variables of interest are student-level attendance, measured as a percent of days present (excluding excused absences), an indicator for whether a student was suspended from school, math and ELA standardized test scores, and survey-based measures of students’ school engagement and climate. Attendance and suspension data were collected on all students in our sample. Math and ELA standardized tests were only administered in grades 3 to 8. Our school-level dependent variables using BPS student survey data are constructs that measure students’ assessment of their engagement with school learning, teacher engagement, school enjoyment, sense of belonging at school, and school safety. Our BPS teacher survey constructs are measures of teachers’ assessments of their schools’ student engagement, parent engagement, teacher engagement, collegiality amongst school personnel, and sense of respect from students and parents. We initially formed constructs from survey items based on themes pertaining to school engagement and climate, and then adjusted these constructs through exploratory factor analyses. The composition of each of these constructs, along with Cronbach’s alpha measures of internal consistency, are provided in Appendix Tables A1 and A2.

Sample

Our analytical sample is comprised of 123,753 students with 496,236 total student-year observations at 169 traditional public schools. For our independent variable of interest, 57% of students were enrolled in at least one arts course per year (Table 1). Descriptive statistics on our dependent variables of interest show that the students in our sample had an average of a 94% average daily attendance rate. Sixteen percent of students were “chronically absent,” defined as missing 10% or more of the days they were enrolled in a given school year. Six percent of students were suspended over the course of a school year. In terms of student demographics and program participation, 75% of the students in our sample were identified as economically disadvantaged, 20% were receiving an IEP, 28% were receiving ELL program services, 40% identified as Hispanic, 37% as African-American, 13% as white, and 9% as Asian.

We use BPS’s student and teacher survey data to assess school engagement and climate. Though we are able to use individual student- and teacher-level survey responses to generate constructs, responses can only be linked to schools, not to individual respondents or their grade levels.

Table 1. Student Descriptive Characteristics.

Variable	Mean	Std. Dev.	Min	Max
Took arts course	0.574	0.494	0	1
Attendance rate	0.938	0.099	0	1
Chronically absent	0.163	0.369	0	1
Suspended	0.058	0.234	0	1
Grade level	6.635	3.505	1	12
Female	0.487	0.500	0	1
Economically disadvantaged	0.754	0.431	0	1
IEP	0.196	0.397	0	1
ELL	0.280	0.449	0	1
Race/Ethnicity				
Asian	0.092	0.290	0	1
African-American	0.366	0.482	0	1
Hispanic	0.402	0.490	0	1
White	0.134	0.340	0	1

Therefore, we aggregated annual school-level responses for these analyses. We limit our survey analyses to data from 2012-2013 through 2015-2016 because this was the longest period with consistent survey items from one year to the next. Student and teacher survey participation was optional; student survey participation was restricted to students enrolled in grades 4 through 11. Ninety-four percent of schools had student survey participants. The overall eligible student response rate was 88%. Ninety-nine percent of schools had teacher survey participants. The overall teacher response rate was 70%, based on total number of teacher responses divided by the total number of teacher full time equivalents (FTEs) according to the Massachusetts Department of Elementary and Secondary Education.

We also obtained school-level arts educational resource data from the Massachusetts Department of Elementary and Secondary Education and EdVestors, a school improvement organization that has collected BPS school-level arts education data for 87% of the school-level observations in our sample since 2009. The Massachusetts Department of Elementary and Secondary Education data provide schools' number of arts FTEs over this period. The EdVestors data provide schools' number of partnerships with arts organizations and the number and type of arts disciplines offered at the school. These data provide a sense of schools' arts educational resources for the students in this study. The schools in our sample, on average, had 1.9 arts teacher FTEs, 1.5 arts organization partnerships, and provided 2.6 arts disciplines. The most commonly-offered arts disciplines were visual arts

Table 2. School-Level Descriptive Statistics.

Variable	N	Mean	Std. Dev.	Min	Max
School size	1,388	357.5	335.3	1	2,443
Pct. student took arts course	1,388	0.618	0.371	0	1
Arts FTEs	1,380	1.929	2.007	0	16
School arts partners	1,210	1.573	1.682	0	8
Number arts disciplines	1,275	2.645	1.119	1	5
Visual	1,275	0.805	0.397	0	1
Music	1,275	0.737	0.440	0	1
Theater	1,275	0.452	0.498	0	1
Dance	1,275	0.404	0.491	0	1
Media	1,275	0.247	0.431	0	1

Note. EdVestors provided data on school arts resources, arts FTES, number of school arts partners, and number of types of arts disciplines offered at school. BPS provided data on the other variables. The survey was constructed such that eight was the maximum number of school arts partners that a school could report.

(81% of schools) and music (74%). About 45% of schools offered theater, 40% offered dance, and 25% offered media arts. School-level arts education summary statistics are provided in Table 2.

Empirical Method

Our goal is to estimate the causal effect of arts course-taking on students' school engagement and climate outcomes. Merely comparing students in arts courses to those who do not enroll is likely biased by self-selection because students may have some choice in taking arts courses (Elpus, 2013). Moreover, the availability of arts courses within schools are nonrandom and likely related to other attributes related to school quality, and some schools may assign or encourage students to take arts courses based on student attributes (Elpus, 2022).

Our primary identification strategy addresses these concerns by leveraging variation in the assignment and timing of taking an arts course within a regression model that holds constant student and school fixed effects. This model controls for the time invariant factors that are fixed for students and schools and takes the following form:

$$Y_{igst} = \alpha + \beta \text{ArtsCourse}_{it} + \rho \mathbf{X}_{st} + \delta_i + \gamma_g + \theta_s + \rho_t + \epsilon_{igst} \quad (1)$$

Y_{igst} represents our outcomes of interest: student attendance rates, whether a student was chronically absent, whether a student was suspended, and

standardized math and reading scores for student i , in grade g , in school s , at time t . X_{st} is a vector of time-variant school characteristics including percent of students who are identified as African-American or Hispanic, percent of students identified as economically disadvantaged, percent of students receiving an IEP, percent of students participating in an ELL program, and school size; δ_i , γ_g , θ_s , and ρ_t are student, grade, school, and year fixed effects. *ArtsCourse* is a dummy variable indicating the student is enrolled in an arts course, and we are primarily interested in β , which captures the effect of taking an arts course on our outcomes.

Prior studies have found arts education-related impacts to vary substantially by student subgroups with variations in school engagement and differences in arts learning opportunities and resources (Elpus, 2013, 2022; Elpus & Abril, 2019; Gara & Winsler, 2020; Greene et al., 2014; Kisida et al., 2014; Meyer et al., 2004; Redford et al., 2018; Winsler et al., 2020). Studies have also shown that arts learning opportunities and impacts vary substantially by students' grade level (Bowen et al., 2014; Bowen & Kisida, 2022; Carey et al., 1995; Miksza, 2013; Parsad & Spiegelman, 2011; Sparks et al., 2015). Therefore, we also estimate models restricted to students in grade-levels K-5, female and male students, economically disadvantaged students, students receiving ELL services, students with IEPs, African-American and Hispanic students, students who have patterns of chronic absenteeism, which we define as being chronically absent for at least two school years, and students who scored in the lowest quartile in terms of their average ELA and math standardized test achievement. We then estimate models restricted to the aforementioned subgroups by elementary and secondary grade-level status.

Our analyses of arts course-taking impacts on student and teacher survey outcomes are aggregated to the school level. For these analyses, we are also concerned that unobservable school characteristics may confound relationships between indicators of arts exposure and resources and our outcomes. We address this concern by leveraging variation in arts indicators over time in a regression model that includes school fixed effects, holding constant schools' time invariant characteristics. This model takes the following form:

$$Y_{st} = \alpha + \beta \text{ArtsCourse}_{st} + \rho X_{st} + \theta_s + \rho_t + \epsilon_{st} \quad (2)$$

Y_{st} represents our outcomes of interest, including various survey measures of school engagement and climate in school s at time t . These measures include student survey constructs for students' school learning engagement, teacher engagement, enjoyment of school, sense of belonging, and school safety. Teacher survey constructs include their assessments of student, parent, and teacher engagement, sense of respect from students and parents,

and collegiality of faculty, staff, and administrators. X_{st} is a vector of time-variant school characteristics including percent of students identified as African-American or Hispanic, percent of students identified as economically disadvantaged, percent of students receiving an IEP, percent of students participating in an ELL program, and school size; θ_s and ρ_t are school and year fixed effects. *Arts* represents our independent variable of interest, which is a school's percent of students taking an arts course. We are primarily interested in β , which captures the effect of school-level arts course enrollment on our outcomes.

Results

Student-Level Administrative Data Outcomes

Our primary analysis examines the effects for individual students taking an arts course in a school year, across the full sample and relevant student subgroups (Table 3). Overall, we find significant increases in average daily attendance, a decrease in the likelihood a student is chronically absent, and an increase in whether a student is suspended. The overall average daily attendance effect is a 0.2 of a percentage point increase, which translates to roughly one third of a day in a 180-day school year. The effect on chronic absenteeism is a decrease by 0.5 of a percentage point. The effect on student suspensions amounts to a 0.3 of a percentage point increase in the likelihood of a student being suspended. We find no significant effects on students' math and reading achievement for the full sample.

The attendance result is consistently positive with some variation across subgroups. Improvements in student attendance, both average daily attendance rate and the probability of chronic absenteeism, are largely driven by students receiving IEPs, African-American students, students with a history of chronic absenteeism, and students with lower test standardized test scores. Students with IEPs experience an effect that is approximately twice the magnitude of the effect for the full sample, translating to about two-thirds of an additional day per school year and a 0.9% point decrease in chronic absenteeism. We observe the largest effects for students with lower test scores and those with a history of chronic absenteeism. Students with lower test scores and a history of chronic absenteeism experience 0.005 and 0.006% point improvements, respectively, in their average daily attendance; this improvement translates to 0.9 and 1.1 additional days in an average school year when enrolled in an arts course. Improvements in attendance for lower-scoring and students with a history of chronic absenteeism are also reflected in 1.4 and 1.3% point decrease, respectively, in the likelihood of being chronically absent.

Table 3. Effects of Students Taking an Arts Course: Full Sample and Subgroups.

Sample	Attendance	Chronically absent	Suspended	ELA	Math
Full sample	0.002*** (0.000) 496,236	-0.005*** (0.001) 496,236	0.003*** (0.001) 496,236	0.002 (0.003) 210,644	-0.001 (0.003) 212,511
Elementary level	0.002*** (0.000) 199,338	-0.011*** (0.002) 199,338	0.003** (0.002) 199,338	-0.003 (0.007) 103,769	0.006 (0.007) 104,798
Secondary level	0.001** (0.000) 296,898	0.000 (0.002) 296,898	0.004*** (0.001) 296,898	0.026*** (0.005) 106,875	0.010** (0.004) 107,713
Female	0.001*** (0.000) 241,846	-0.004** (0.002) 241,846	0.002 (0.001) 241,846	0.002 (0.005) 103,150	-0.001 (0.004) 103,953
Male	0.002*** (0.000) 254,388	-0.006*** (0.002) 254,388	0.005*** (0.002) 254,388	-0.001 (0.005) 107,494	-0.001 (0.005) 108,558
Economically disadvantaged	0.002*** (0.000) 373,926	-0.007*** (0.002) 373,926	0.003*** (0.001) 373,926	0.001 (0.004) 163,403	-0.005 (0.004) 164,733
ELL	0.002*** (0.001) 139,010	-0.005** (0.003) 139,010	0.001 (0.002) 139,010	-0.008 (0.007) 57,696	-0.009 (0.006) 59,453
IEP	0.004*** (0.001) 97,413	-0.009*** (0.003) 94,413	0.008*** (0.003) 97,413	-0.014* (0.008) 42,651	-0.011 (0.007) 42,776
African-American	0.003*** (0.001) 181,686	-0.011*** (0.002) 181,686	0.004** (0.002) 181,686	0.004 (0.006) 73,518	-0.005 (0.005) 73,993
Hispanic	0.002*** (0.001) 199,325	-0.003 (0.002) 199,325	0.004** (0.002) 199,325	0.000 (0.005) 87,564	-0.004 (0.005) 88,443
Lowest quartile test scores	0.005*** (0.001) 94,284	-0.014*** (0.003) 94,284	0.009*** (0.003) 94,284	-0.010 (0.006) 48,825	-0.010* (0.005) 49,689
History of chronic absenteeism	0.006*** (0.001) 127,975	-0.013*** (0.004) 127,975	0.007*** (0.002) 127,975	-0.009 (0.006) 53,176	-0.009 (0.006) 53,451

Note. Robust standard errors in parentheses; sample size provided below standard errors. Standardized tests were only administered to students in grades 3 to 8. Elementary level is grades 1 to 5; secondary level is grades 6 to 12.

***Statistically significant (two-tailed) at $p < .01$; **Significant at $p < .05$; *Significant at $p < .10$.

The suspension effect is fairly inconsistent across subgroups, and appears to be largely driven by male students, students receiving IEPs, students with lower test scores, and chronically absent students. While these results are statistically significant, they do not appear to be practically significant. We attempt to further unpack this unexpected finding in our discussion in the next section.

Though we do not find an overall effect on ELA and math achievement, we do find evidence to suggest positive spillover effects of arts learning on ELA and math achievement for middle school students (grades 6–8) of 0.03 and 0.01 of a standard deviation, respectively.

We next analyze subgroup effects at the elementary school level (Table 4). Similar to the full sample, improvements in average daily attendance and reductions in chronic absenteeism for elementary school students are robust across student subgroups, and are largely driven by students with IEPs, African-American students, students with lower test scores, and chronically absent students. The negative effect on suspension appears to be predominantly driven by students with lower test scores and students with a history of chronic absenteeism. Finally, while there was not a significant spillover effect on test scores with the full elementary student sample, we do find a small, positive effect on African-American students' math scores.

Lastly, we analyze subgroup effects at the secondary school level (Table 5). Unlike the full sample analysis, the secondary school level analysis indicates positive attendance effects across fewer subgroups. We do not find significant attendance effects for female, ELL, Hispanic, and white students. Increases in average daily attendance effect are primarily driven by economically disadvantaged students, students with an IEP, African-American students, students with lower test scores, and those with a history of chronic absenteeism. Only African-American students experience a reduction in chronic absenteeism at the secondary school level. Small increases in the likelihood of being suspended for secondary school students is predominantly driven by male students, students with IEPs, African-American students, white students, students with lower test scores, and students with a history of chronic absenteeism. Finally, the positive spillover effects on ELA test scores appear to be driven by females, African-American students, and white students. Math improvements are comparatively smaller and do not meaningfully vary.

School-Level Survey Data Outcomes

We next turn to impacts on student and teacher survey outcomes examined at the school level using a school fixed effects model. We examine the

Table 4. Effects of Elementary School Students Taking an Arts Course.

Sample	Attendance	Chronically absent	Suspended	ELA	Math
Elementary level	0.002*** (0.000) 199,338	-0.011*** (0.002) 199,338	0.003* (0.002) 199,338	-0.003 (0.007) 103,769	0.006 (0.007) 104,798
Female	0.002*** (0.001) 96,544	-0.007** (0.003) 96,544	0.002 (0.002) 96,544	-0.004 (0.010) 50,756	0.009 (0.010) 51,230
Male	0.002*** (0.000) 102,794	-0.015*** (0.003) 102,794	0.003 (0.003) 102,794	-0.002 (0.010) 53,013	0.003 (0.010) 53,568
Economically disadvantaged	0.002*** (0.000) 156,337	-0.011*** (0.003) 156,337	0.003 (0.002) 156,337	0.001 (0.008) 81,925	0.005 (0.008) 82,635
ELL	0.002*** (0.001) 71,324	-0.010** (0.004) 71,324	0.003 (0.002) 71,324	0.000 (0.012) 33,968	0.010 (0.012) 34,896
IEP	0.003*** (0.001) 40,467	-0.012* (0.006) 40,467	0.004 (0.005) 40,467	-0.016 (0.017) 21,352	0.009 (0.017) 21,430
African-American	0.003*** (0.001) 68,012	-0.017*** (0.004) 68,012	0.005 (0.003) 68,012	0.004 (0.012) 35,779	0.021* (0.011) 36,046
Hispanic	0.002*** (0.001) 86,886	-0.009** (0.004) 86,886	0.003 (0.002) 86,886	-0.002 (0.010) 44,871	-0.001 (0.010) 45,366
Lowest quartile test scores	0.003*** (0.001) 40,506	-0.019*** (0.006) 40,506	0.009** (0.005) 40,506	0.017 (0.013) 23,104	0.012 (0.012) 23,507
History of chronic absenteeism	0.006*** (0.001) 41,194	-0.033*** (0.009) 41,194	0.010** (0.004) 41,194	0.013 (0.014) 22,489	0.005 (0.014) 22,613

Note. Robust standard errors in parentheses; sample size provided below standard errors. Standardized tests were only administered to students in grades 3 to 8; ELA and math effect estimates pertain to students in grades 3 to 5 for these elementary student subgroup analyses.

***Statistically significant (two-tailed) at $p < .01$; **Significant at $p < .05$; *Significant at $p < .10$.

Table 5. Effects of Secondary School Students Taking an Arts Course.

Sample	Attendance	Chronically absent	Suspended	ELA	Math
Secondary level	0.001** (0.000)	0.000 (0.002)	0.004*** (0.001)	0.026*** (0.005)	0.010** (0.004)
Female	296,898	296,898	296,898	106,875	107,713
	0.000 (0.001)	0.000 (0.002)	0.001 (0.002)	0.030*** (0.006)	0.009 (0.006)
	145,302	145,302	145,302	52,394	52,723
Male	0.001** (0.001)	0.000 (0.002)	0.007*** (0.002)	0.021*** (0.006)	0.011* (0.006)
	151,594	151,594	151,594	54,481	54,990
Economically disadvantaged	0.002*** (0.001)	-0.003 (0.002)	0.004** (0.002)	0.022*** (0.005)	0.004 (0.005)
	217,589	217,589	217,589	81,478	82,098
ELL	0.001 (0.001)	0.001 (0.004)	-0.001 (0.003)	-0.004 (0.010)	-0.020** (0.009)
	67,686	67,686	67,686	23,728	24,557
IEP	0.004** (0.001)	-0.005 (0.004)	0.010*** (0.004)	-0.013 (0.010)	-0.020** (0.009)
	56,946	56,946	56,946	21,299	21,346
African-American	0.002** (0.001)	-0.006** (0.003)	0.005** (0.002)	0.034*** (0.008)	0.006 (0.007)
	113,674	113,674	113,674	37,739	37,947
Hispanic	0.000 (0.001)	0.003 (0.003)	0.005*** (0.002)	0.010 (0.007)	-0.002 (0.006)
	112,439	112,439	112,439	42,693	43,077
White	0.001 (0.001)	0.002 (0.004)	0.006** (0.003)	0.043*** (0.013)	0.036*** (0.012)
	39,515	39,515	39,515	15,261	15,268
Lowest quartile test scores	0.003** (0.001)	-0.004 (0.004)	0.010** (0.004)	-0.004 (0.009)	-0.019*** (0.007)
	53,778	53,778	53,778	25,721	26,182
History of chronic absenteeism	0.003*** (0.001)	-0.000 (0.004)	0.007** (0.003)	-0.005 (0.008)	-0.006 (0.007)
	86,781	86,781	86,781	30,687	30,838

Note. Robust standard errors in parentheses; sample size provided below standard errors. Standardized tests were only administered to students in grades 3 to 8; ELA and math effect estimates pertain to students in grades 6 to 8 for these secondary school student subgroup analyses.

***Statistically significant (two-tailed) at $p < .01$; **Significant at $p < .05$; *Significant at $p < .10$.

Table 6. School-Level Arts Course-Taking on Student Climate Survey Outcomes.

	N	Learning engagement	Teacher engagement	Enjoys school	School belonging	School safety
Full sample	470	0.070* (0.036)	0.136** (0.062)	0.052 (0.044)	0.036 (0.046)	-0.025 (0.039)
Elementary level school	172	0.054 (0.053)	0.044 (0.050)	0.039 (0.067)	0.076 (0.068)	0.013 (0.044)
Higher ELL	227	0.047 (0.040)	0.048 (0.093)	0.171** (0.064)	0.157** (0.072)	-0.007 (0.049)
Higher poverty	232	-0.002 (0.046)	0.019 (0.077)	0.005 (0.057)	-0.004 (0.051)	-0.031 (0.045)
Higher minority	231	0.020 (0.055)	0.005 (0.079)	0.022 (0.069)	0.009 (0.076)	-0.043 (0.053)
Lower test score achievement	229	0.055 (0.058)	0.092 (0.083)	0.067 (0.065)	0.058 (0.071)	0.010 (0.055)

Note. Robust standard errors in parentheses. Overall sample consists of 131 schools. “Higher” designation determined by whether school average mean for specified demographic variable was above the median relative to the rest of the sample.

**Statistically significant (two-tailed) at $p < .05$; *Significant at $p < .10$.

impacts of the proportion of a schools’ students enrolled in arts courses on students’ assessments of their own learning engagement, teacher engagement, school enjoyment, sense of belonging at school, and school safety, and on teachers’ assessments of student engagement, parent engagement, teacher engagement, sense of respect from students and parents, and the collegiality of school faculty, staff, and administration.

We find that increases in a school’s proportion of students taking arts courses positively affects students’ school engagement and climate as reflected in their own assessments of their learning engagement and in their ratings of teachers’ engagement. The independent variables of interest are operationalized as the percent of students in a school who are enrolled in an arts course; therefore, estimates in Tables 6 and 7 show the effect of going from a school with zero to 100% of students enrolled in an arts course. Effects for smaller increases can be calculated by scaling the size of the effect accordingly. For example, a 20-percentage point increase in arts course enrollments improves student-assessed learning engagement by 0.01 of a standard deviation and their assessment of teacher engagement by 0.03 of a standard deviation. We do not find significant effects on students’ enjoyment of school, sense of belonging, or school safety with the full sample.

Table 7. School-Level Arts Course-Taking on Teacher Climate Survey Outcomes.

	N	Student engagement	Parent engagement	Teacher engagement	Student and parent respect	Collegiality
Full sample	463	0.249*** (0.078)	0.192*** (0.061)	0.123 (0.088)	0.124* (0.074)	0.183 (0.123)
Elementary level school	184	0.114 (0.079)	0.154* (0.089)	0.300** (0.118)	0.169** (0.076)	0.239 (0.179)
Higher ELL	228	0.223** (0.101)	0.122 (0.091)	0.302** (0.116)	0.009 (0.105)	0.431*** (0.163)
Higher poverty	222	0.135* (0.075)	0.258*** (0.064)	0.055 (0.096)	0.003 (0.102)	0.160 (0.185)
Higher minority	219	0.271*** (0.092)	0.238*** (0.069)	0.166 (0.115)	0.135 (0.083)	0.237 (0.168)
Lower test score achievement	224	0.243** (0.112)	0.301*** (0.069)	0.165 (0.113)	0.208* (0.105)	0.305* (0.156)

Note. Robust standard errors in parentheses. Overall sample consists of 137 schools. "Higher" designation determined by whether school average mean for specified demographic variable was above the median relative to the rest of the sample.

***Statistically significant (two-tailed) at $p < .01$; **Significant at $p < .05$; *Significant at $p < .10$.

We investigate effect heterogeneity by school level as well as according to whether a school was above and below the median in terms of their proportions of students receiving ELL program services, students identified as economically disadvantaged, African-American and Hispanic students, and students with average test scores in the lowest quartile. We find that schools with higher proportions of ELL students experience significant increases in students' school enjoyment and sense of belonging. Student-assessed learning engagement and teacher engagement effects also tend to be stronger with secondary schools and schools with lower proportions of students who are participating in ELL programs, economically disadvantaged, and African-American and Hispanic students (Table 6).

Finally, we examine the impacts of school-level arts course enrollments on teacher-assessed school engagement and climate outcomes. We find that when schools have more students taking arts courses, teachers report significant improvements in student and parent engagement. A 20-percentage point increase in the proportion of students taking arts course positively affects student and parent engagement by 0.05 and 0.04 of a standard deviation, respectively. Teachers also indicate feeling a greater sense of respect from

students and their parents, an indication of a more positive school climate. A 20-percentage point increase in arts course-taking positively affects teachers' sense of student and parent respect by 0.02 of a standard deviation. We do not find significant effects on teacher engagement and school collegiality for the full sample.

We also investigate effect heterogeneity for our teacher survey outcomes. We find that the student and parent engagement effects are fairly robust across subgroups and that the improvement in parent engagement is larger for schools with higher proportions of African-American and Hispanic students and those with lower average standardized test scorers. The positive effect on teachers' sense of student and parent respect is primarily driven by effects with elementary schools and those with higher proportions of lower test scorers. While we do not find significant effects for the full sample on teacher engagement and collegiality, we do find positive subgroup effects on teacher engagement for elementary schools and for schools with higher proportions of ELL students. Finally, we observe significant increases on school collegiality for schools with higher proportions of ELL students and lower test scorers (Table 7).

Discussion and Conclusion

Employing individual and school fixed effects analyses with a rich dataset that spans 11 years, we find consistent evidence that arts course-taking improves students' school engagement and climate. When students take arts courses, their attendance improves, both in terms of average daily attendance rate and a lower likelihood of being chronically absent; they report being more engaged in their learning; and their teachers report that they are more engaged in school. Increases in the percent of students taking arts courses positively affects school climate in terms of improving students' perspectives of teacher engagement, teachers' impressions of parent engagement, and teachers' reports of respect from students and their parents.

Our findings corroborate theoretical claims and prior empirical findings that arts learning facilitates social-emotional development (Bowen & Kisida, 2022; Catterall et al., 2012; Deasy, 2002; Farrington et al., 2019; Fiske, 1999; Thomas et al., 2015). Though our data limit our ability to precisely isolate the mechanisms, prior studies note that arts education provides opportunities for student expression, collaboration, and interaction, which can promote interpersonal relationship skills and improve school social capital (Barrett & Bond, 2015; Farrington et al., 2015; Hoxie & Debellis, 2014; Ruppert, 2006). Our findings generally support these contentions and

support strategies to improve school engagement and climate through increases in arts learning opportunities.

The student attendance finding is consistently positive across a range of student characteristics. While the effect is modest in magnitude from an individual student perspective, the implications for educational administrators and policymakers are noteworthy. Given a standard 180-day school year; this effect translates into nine additional days of instruction for a class of 25 students. These attendance effects are also substantial when compared to effects of recent interventions designed for mitigating truancy (e.g., Guryan et al., 2021; Riccio et al., 2013; Robinson et al., 2018; Smythe-Leistico & Page, 2018). Most notably, we find the largest effects for students who schools have struggled to engage: students with IEPs, students with a history of chronic absenteeism, and students in the bottom quartile of standardized test score achievement. For students with lower test scores and those with a history of chronic absenteeism, the average daily attendance effect equates to roughly an additional 0.9 and 1.1 day present, respectively, when enrolled in an arts course. A vast majority of states now include a measure of chronic absenteeism in their school accountability plans (Education Commission of the States, 2021; English, 2017). Therefore, given the recent concerns with chronic absenteeism and the heightened focus to mitigate low attendance, this result has important implications for educational administrators and policymakers who are seeking ways to engage struggling students (Ansari & Gottfried, 2021; Gottfried & Hutt, 2019; Hamlin, 2021; Liu et al., 2021).

Increases in survey items measuring school engagement and school climate are particularly noteworthy for advancing theory regarding the effects of arts education. Increased arts course-taking positively affects student and parent engagement, as well as multiple indicators of school climate. Though the effects we estimate may seem small, the full implications of increased social-emotional development remain an understudied topic. Related research finds that when schools improve social-emotional development, they have better attendance rates, higher graduation rates, and higher college attendance rates (Jackson, 2018; Jackson et al., 2020). Our findings are an important first step toward building a more holistic theory of the effects of arts learning in schools.

Though test scores gains are not the primary objective of arts learning, the fact that we observe small improvements in ELA and math achievement for middle schoolers is an indication that arts learning may have some spillover effects and does not appear to crowd out student performance in other subjects. This aligns with recent research that finds social-emotional

development explains a considerable amount of schools' impacts on test scores (Jackson et al., 2020). This evidence counters the intuition behind school accountability reforms that have narrowed the curriculum and reduced learning opportunities not directly tied to state accountability assessments (Bassok et al., 2016; Dee et al., 2013; West, 2007). Arts education does not appear to substantially improve students' math and ELA test scores, but it also does not appear to negatively affect achievement in other subjects. School administrators seeking to leverage test score gains by cutting the arts are likely following a misguided strategy.

The small increases in suspension rates are puzzling, as we are not aware of any prior research that has found that arts education experiences contribute to more disciplinary infractions. In fact, the only causal study that addresses this question found that arts learning reduces student disciplinary infractions (Bowen & Kisida, 2022). One possible explanation is that students involved in the arts, especially in middle or high school, tend to spend more time at school beyond the regular school day. Increasing the amount of time students spend at school may provide additional occasions for students to receive disciplinary infractions. Another possibly related explanation is that increasing engagement for low-income and students of color may further subject them to school discipline practices that have been shown to have disparate impacts (Anderson & Ritter, 2017; Barrett et al., 2021; Loveless, 2017). That said, the magnitude of the effects we observe are not practically significant.

This study provides a more solid empirical foundation for building theory regarding arts education, designing interventions, and guiding future evaluations. Future research should continue to explore the role of arts education in enhancing school engagement, social and emotional learning, and school climate. As education researchers, policymakers, and parents have shifted to prioritizing a broader range of educational outcomes, studies of arts education should similarly expand by exploring how these outcomes are affected through the arts.

From a policy perspective, our findings shed new light on the role that arts education plays in improving school engagement and climate. Students receiving the arts in school attend more, are more engaged, and their parents and teachers are also more likely to participate and be actively engaged at school. As education administrators and policymakers seek ways to connect with students and their parents, these results suggest one strategy for improving school engagement and climate is through strengthening arts education.

Appendix

Table A1. Student Climate Survey Outcomes: Items and Reliability.

Outcome	Items	Cronbach's alpha
Learning engagement	<ul style="list-style-type: none"> • I work hard to make good grades on my assignments. • I pay attention in class. • When I am in class, I concentrate on doing my work. • When I am in class, I work as hard as I can. • It is important to succeed in my classes. • I am interested in learning new things. • I participate in class activities. • I complete homework assignments. 	.89
Teacher engagement	<ul style="list-style-type: none"> • My teacher(s) works hard to help me learn. • My teacher(s) does a good job of letting me know how I am doing in class. • My teacher(s) is doing a good job. • My teacher(s) is fair to me. • My teacher(s) expects me to make good grades. • My teacher(s) makes sure I understand what I am learning in class. 	.90
School enjoyment	<ul style="list-style-type: none"> • I usually look forward to my classes. • I would recommend this school to my friends. • I enjoy going to school every day. • I am proud to be a student at this school. • School is a place where I feel like I belong. • When I am in class, I work as hard as I can. • I participate in class activities. 	.85
Sense of belonging	<ul style="list-style-type: none"> • School is a place where I feel like I belong. • I make friends easily at school. • Other students at school seem to like me. • People at school care about me. 	.75
School safety	<ul style="list-style-type: none"> • Are you ever afraid at school? (reverse coded) • Do other students tease you or make fun of you? (reverse coded) • Do you ever feel bullied or threatened at school? (reverse coded) 	.75

Source. Boston Public Schools (2012–2013 through 2015–2016) Student Climate Survey for Elementary Grades and Student Climate Survey for Grades 6 to 11.

Table A2. Teacher Climate Survey Outcomes: Items and Reliability.

Outcome	Items	Cronbach's alpha
Student engagement	<ul style="list-style-type: none"> • Students are willing to put in the work it takes to get good grades. • Students try hard to improve on previous work. 	.82
Parent engagement	<ul style="list-style-type: none"> • The parents of most of your students are active in the school's parent organization. • Most of your students' parents/guardians talk with you about their child's grades. • Most parents encourage you to maintain high standards. • Parents advocate for school improvement at this school. • Parents of your students help check their child's homework. 	.86
Teacher engagement	<ul style="list-style-type: none"> • Teachers here take responsibility for improving the school. • Teachers in my school set high standards for themselves. • Teachers in my school feel responsible for making sure that all students learn. • Teachers in my school are really trying to improve their teaching. 	.90
School administration, faculty, and staff collegiality	<ul style="list-style-type: none"> • Teacher help and support each other. • Teachers respect the professional competence of their colleagues. • There is a great deal of cooperative effort among the staff members. • Teachers at this school collaborate to plan instruction. • Teachers at this school are eager to share information about what works in their classrooms. • You are respected by other staff members. • Your principal treats all faculty members fairly. • The administration's behavior toward the staff is supportive and encouraging. • You would recommend this school as a good place to teach. • Your principal involves the staff members before s/he makes important decisions. • Staff members are recognized by the school's administration for a job well done. 	.91
Student and parent respect	<ul style="list-style-type: none"> • You feel respected by your students. • You feel respected by your students' parents. 	.75

Source: Boston Public Schools (2012–2013 through 2015–2016) Teacher Climate Survey.

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