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# You make me feel like dancing: the effects of dance exposure on children's cultural interests and social-emotional development

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**ABSTRACT**

Stratification by race and socioeconomic status generates disparities in cultural exposure and consumption. Though public education can serve as a mechanism for addressing social inequalities, schools with high concentrations of low-income and minority students often lack the resources to provide enriching cultural experiences. Efforts to make cultural exposure and consumption more equitable remain stymied by school and neighborhood stratification, as well as by lingering questions about the value of cultural consumption for students. Employing a randomized research design, we analyze the effects of elementary students in under-resourced schools participating in a collaborative dance program provided by a major ballet company. We find that participation increases students' enthusiasm for dance and sense of self-efficacy. Students with prior lower levels of arts and culture exposure demonstrate the largest gains in self-efficacy and experience an increase in their sense of school connectedness. Male students, who were less enthusiastic about dance prior to the program, show the largest increase in dance enthusiasm. These findings demonstrate that targeted efforts by schools and arts organizations can play a meaningful role in students' cultural capital acquisition, which in turn leads to higher student self-efficacy and sense of belonging, particularly for students with lower levels of arts and cultural learning experience.

**KEYWORDS**

Arts education policy; cultural consumption and participation; dance; social-emotional development

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## 1. Introduction

Stratification by race and socioeconomic status (SES) have led to disparities in access to cultural exposure and consumption (Chan, 2010; DiMaggio, 1991; Katz-Gerro, 1999).[1] Concentrated geographical stratification has led to regions of cultural deserts, even when cultural organizations are nearby (Blume-Kohout et al., 2015; Brook, 2016; Falk & Katz-Gerro, 2016). In the United States, public schools are a key method by which students are provided opportunities to engage in arts and cultural learning experiences, but the resources necessary for these opportunities tend to not be distributed equally. Schools serving greater concentrations of low-income and minority students systematically receive less access to enriching cultural experiences (Government Accountability Office, 2009). This lack of resources produces deficits in opportunities to acquire cultural capital and deprives students of valuable educational experiences that have enduring effects into adulthood, but there remains limited empirical evidence to inform whether schools can effectively address disparities and how such efforts affect students' holistic development.

There are longstanding debates about the capacity of schools to serve as viable channels for addressing cultural capital disparities. Bourdieu (1977) posited that schools are likely to exacerbate inequalities through cultural reproduction, while DiMaggio (1982) contended that cultural capital could be acquired throughout one's life, and that the benefits were likely greater for those with initial lower levels. Explicit in Bourdieu's theory of cultural reproduction is that initial familial transmission of cultural capital is essential to individuals' abilities to acquire it throughout their lifetimes. Conversely, DiMaggio's theory of cultural mobility contends that disadvantaged children can acquire cultural capital from sources outside of the family.

There also remain important questions about the effects of arts and cultural engagement on students' educational outcomes, as researchers have only recently employed causal research designs. Results to date are

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promising, but there remain critical questions about the types of impacts that cultural engagement has on student development, the potential for heterogeneous effects based on students' past experiences with arts and cultural engagement, and whether findings are generalizable or specific to particular disciplines and formats. Specifically, researchers have found arts learning produces positive effects on school climate and students' school engagement and social-emotional development, but additional investigations are needed to further examine how the arts affect student-school dynamics (Bowen & Kisida, 2024; 2023). Additionally, prior studies provide evidence that students from lower SES backgrounds experience greater benefits from cultural exposure, but have not precisely examined whether prior arts and cultural engagement moderates these effects (Greene et al., 2014). Finally, though arts education is often broadly conceptualized, it is comprised of a vast array of disciplines, provided through a multitude of formats, many of which have not been investigated with approaches that identify causal relationships between arts disciplines and students' educational outcomes (Holochwost et al., 2021; Winner et al., 2013).

For this study, we conducted a student-level experiment with 451 elementary school students to investigate the causal impacts of a collaborative in-school dance educational program on students' desire for cultural capital acquisition, self-efficacy, school connectedness, learning engagement, and peer relationship skills. We find that this participatory dance program significantly increases students' desire for cultural capital acquisition in terms of dance enjoyment and enthusiasm while also improving their sense of self-efficacy. Male students in our sample, who exhibited lower levels of dance enjoyment and enthusiasm at baseline, appear to drive the positive effect on this outcome. We also find that students' prior arts and cultural engagement serves as a critical moderator. Students with lower levels of arts and cultural engagement experience greater gains in self-efficacy and sense of school connection. These findings support the notion of cultural mobility and suggest that schools can serve a valuable role in addressing disparities by providing arts and cultural experiences.

## 2. Background

### 2.1. Cultural capital

Bourdieu (1977) described cultural capital as "instruments for the appropriation of symbolic wealth socially designated as worthy of being sought and possessed" (p. 488). According to his theory of cultural reproduction, the appropriation of cultural capital result in the consistent reproduction of inequalities and the reinforcement of existing class disparities. Bourdieu identifies various forms of cultural capital pertinent to childhood education: objectified, embodied, and institutionalized. Objectified cultural capital encompasses material goods such as books or paintings in the home; embodied cultural capital includes the knowledge and skills necessary to appreciate and understand cultural goods; and institutionalized cultural capital refers to educational credentials or qualifications recognized by the upper class (Bourdieu, 1977).

Bourdieu maintained that schools exacerbate inequalities by granting greater academic capital to students with existing cultural capital. Conversely, DiMaggio (1982) suggests that cultural capital is not necessarily a fixed attribute, and that cultural capital acquired throughout childhood and adolescence has positive academic and social benefits. From DiMaggio's view, children with lower levels of cultural capital benefit from the investments and opportunities that enable them to compensate for disparities.

### 2.2. Cultivating arts and cultural engagement

Engaging in arts and culture is believed to offer a broad array of individual and social benefits, yet there are vast disparities in access and participation. Arts and cultural engagement are highly stratified, both across and within communities (Bennett, 1999; Bourdieu, 1984; Chan, 2010; DiMaggio, 1991; Katz-Gerro, 1999; Peterson, 1992). Much of the research on arts and cultural engagement focuses on trends of consumption type by social strata, consistently finding stark disparities in consumption (e.g., Alderson et al., 2007; Bourdieu, 1984; DiMaggio, 1987; Peterson & Kern, 1996). In the United States there remain substantial differences in arts activity participation rates by race/ethnicity, education level, and household income (Novak-Leonard & Brown, 2011). Participation in arts and cultural engagement has generally declined in the United States, dating back to the latter portion of the twentieth century; these declines have been more dramatic for individuals with lower incomes and less education, thus widening disparities (Bone et al., 2021; DiMaggio & Mukhtar, 2004).

Addressing these inequalities is challenging given their strong connection to intergenerational transmission. Analogous to the strong links between cultural consumption and social stratification, parents lacking the necessary resources struggle to provide their

children with culturally-enriching experiences (Lareau, 2002; Roksa & Potter, 2011). These struggles have manifested in substantial gaps in children's cultural activities and experiences, such as arts lessons, concert going, and museum visits, by family SES and race/ethnicity (Bassok et al., 2016; Crispin & Beck, 2023; Kalil & Ryan, 2020). Similarly, arts educational resources tend to be scarcer in schools that serve neighborhoods with greater proportions of lower income and racial/ethnic minority families (Elpus, 2022; Government Accountability Office, 2009; Parsad & Spiegelman, 2012; Yee, 2014). These disparities have widened over time. Overall rates of childhood arts education in the U.S. have significantly declined from the 1980s through the first decade of the twentieth century, and further analysis of this trend reveals that this decline was almost entirely driven by declines in opportunities for Black and Hispanic students (Rabkin & Hedberg, 2011).

Empirical investigations of arts and cultural engagement and consumption in adulthood suggest that improving schools' arts educational opportunities could play a pivotal role in reducing these disparities. Several analyses of the National Endowment for the Arts' Survey of Public Participation in the Arts indicate that childhood arts education is the strongest predictor of adult arts engagement (Bergonzi & Smith, 1996; Dumais, 2019; Kracman, 1996; Orend, 1988; Rabkin & Hedberg, 2011). Although this connection is perhaps intuitive, questions remain regarding the extent to which the relationship between childhood and adulthood arts and cultural engagement is causal. Only two known experimental studies have attempted to estimate this causal relationship. Using data from a randomized controlled trial, Kisida et al. (2018) show that art museum programs positively affect children's interest in art. Using a behavioral outcome as part of their randomized controlled trial, Kisida et al. (2014) found that students who were randomly assigned to participate in an art museum program were more likely to make a return visit to the museum outside of school.

### 2.3. Educational benefits of arts and cultural engagement

Arts and cultural engagement provide intrinsic value, but numerous studies also find positive relationships between arts and cultural engagement and common education objectives, such as math and reading proficiency and educational degree attainment (Ludwig et al., 2017; Thomas et al., 2015; Wan et al., 2018; Winner et al., 2013). However, many of these studies only establish correlational relationships between arts and cultural engagement and educational benefits (Winner & Cooper, 2000). The nascent field of arts education research has yet to settle on a well-defined theory of change that connects arts education experiences to anticipated and measurable outcomes (Holochwost et al., 2021; McCarthy et al., 2004). This is due in part to the multifaceted nature of arts learning across different arts disciplines, as well as the difficulty in assessing outcomes not commonly found in administrative data.

The American Academy of Arts and Sciences' (2021) two-year Commission on the Arts identified several areas of educational benefits that are supported by theory and research. There is the primary claim that learning about the arts has intrinsic value. Another benefit is that familiarity with the arts can help students acquire cultural capital, which has long-term social and economic benefits (Bourdieu, 1977; Roksa & Potter, 2011; Roscigno & Ainsworth-Darnell, 1999). The report also asserts that arts education broadens one's understanding of other cultures, supports social-emotional development, improves school engagement and connectedness, provides career exploration and skills, and strengthens community and civic engagement. While there is little rigorous evidence that the arts directly affect student achievement in other tested subjects, it remains plausible that such "transfer" effects might occur as an indirect result of arts' mediating influence on school engagement and enjoyment.

A few notable studies have investigated the causal relationship between arts and cultural learning experiences and students' social-emotional development. Substantial increases in schools' arts educational resources improve students' emotional empathy and reduce disciplinary infractions (Bowen & Kisida, 2023). Students randomly assigned to visit art museums or theater performances have exhibited significant increases in empathy and tolerance (Greene et al., 2014; 2018; Kisida et al., 2020). Arts-based field trip studies also find some evidence of improved behavioral outcomes that proxy for school engagement, such as improved attendance and disciplinary outcomes (Erickson et al., 2024; Lacoe et al., 2020).

There are also policy-relevant questions regarding who most benefits from school-sponsored arts education activities. Students' level of prior engagement with arts and cultural experiences are strongly correlated with SES (Bassok et al., 2016; Crispin & Beck, 2023; Kalil & Ryan, 2020). Consequently, lower SES students are more dependent on schools to provide arts access and may experience greater impacts from

such interventions. Prior studies have corroborated this hypothesis, as lower SES students demonstrate more-pronounced positive relationships from school-facilitated arts exposure (Bowen & Kisida, 2023; Catterall et al., 2012; Greene et al., 2014; Kinney & Forsythe, 2005; Kisida et al., 2014; Podlozny, 2000; Thomas et al., 2015).

### 2.4. Dance education

Dance educational opportunities provide unique creative learning experiences (Borowski, 2023; Brown & Parsons, 2008; Hanna, 2008; Karpati et al., 2015). These opportunities may promote children's physical, cognitive, emotional, and social development through experiences that stress movement, coordination, creativity, critical thinking, social skills, problem solving, collaboration, and nonverbal communication (Bonbright & McGreevy-Nichols, 2012; Borowski, 2023; Faber, 2017; Hanna, 2008; Paulson, 1993). Dance education theorists also contend that these opportunities are especially valuable for students who may struggle with verbal modes of learning engagement (Anderson, 2015; Hanna, 2008). However, despite these theorized benefits, the vast majority of public schools do not provide students with dance educational opportunities (Elpus, 2022; Parsad & Spiegelman, 2012).

Much like the broader arts and cultural engagement literature, the empirical research on dance's cultivational and educational benefits have been largely comprised of qualitative and correlational investigations with limited ability to confidently infer causal relationships (Borowski, 2023). Findings from these investigations suggest that dance promotes students' movement skills, heightened sense of self, sense of belonging, creative thinking, social awareness, social behavior, and collaboration skills (Bond & Stinson, 2000; Horowitz, 2003; Koshland et al., 2004; Minton, 2003; Rajan & Aker, 2024; Von Rossberg-Gempton et al., 1999). Other studies have been limited to outcomes typically found in administrative data. For example, Gara and Winsler (2020) conducted a quasi-experimental investigation using a large longitudinal administrative dataset, allowing them to control for student-level observables predictive of students' enrollment in middle school dance. They find suggestive evidence that participating in dance improves students' grades and attendance.

There have been a few studies that have employed randomized controlled trials to examine dance's causal effects on education-relevant outcomes. Kirschner and Tomasello (2010) conducted a short-term experiment with 48 pairs of four-year-olds, finding that randomly assigning children to interactive play with music, singing, and dancing, increased their willingness to engage in spontaneous helping and cooperative problem solving. Lobo and Winsler (2006) randomly assigned a sample of 40 preschoolers to participate in an experimental dance program and found it improved their social skills and behavior. Park (2007) randomly assigned 78 students to a dance (versus physical education) class and found positive effects on their critical thinking and self-efficacy.

The evidence to date appears to be promising regarding the positive impacts of dance on educational outcomes, but critical questions remain. The few studies that have attempted to investigate causal relationships have tended to rely on smaller samples of children engaged in laboratory-like interventions that may not generalize to more common, everyday school dance interventions.

## 3. Program description & study design

The Houston Ballet's $X^3$: Explore Extend, Excel! is a well-established "high energy movement" program, which is grounded in pedagogy from the National Dance Institute. The Houston Ballet has implemented this program with thousands of 3$^{rd}$, 4$^{th}$, and 5$^{th}$ grade participants since 2015 in their everyday school environment during regular hours. Program coordinators contact and schedule Title I elementary schools prior to the start of the upcoming school year. Title I schools are public schools in the United States that have at least 40% of students classified as economically disadvantaged. The program meets students' state-required physical education instructional requirements, thus allowing schools to use $X^3$ as a substitute for regular physical education instruction. School principals select which of the three grade levels receive the program. Professionally-trained teaching artists and musicians then visit school campuses and work directly with students for fifteen total class sessions over the course of two-to-four months that culminates in a group performance for their community, including family and friends.

The Houston Ballet describes the $X^3$ program as one where students delve into the core elements of movement and music, honing their skills in choreography while fostering teamwork dynamics. The Houston Ballet implements the program, but it is not a ballet dance program; it is described as one where "Students learn simple energetic rhythmical movements to music. Students learn the fundamentals of movement and music by mastering choreography with

clarity, energy, and precision" (personal correspondence with Lauren Anderson, Houston Ballet's Associate Director of Education & Community Engagement, August 2, 2024). Every session is imbued with a distinct curricular theme, shaping the content and direction of each class. Students discover the power of dance to convey meaning through dedicated performance and adept execution of thematic techniques and routines. Instructors work with elementary students to craft their culminating choreographed performance infused with inspiration from the curricular theme and their work together throughout the program.

The $X^3$ program has the following student learning objectives: 1) mastering the fundamentals of movement and music through athletic choreography and working creatively as a team; 2) achieving excellence in dance through effort, focus, and teamwork; and 3) learning that dance and music can express meaning through committed performance and mastery of thematic skills. Program administrators also contend that these learning objectives are designed to improve social-emotional learning competencies, including self-awareness, self-efficacy, self-management, social awareness, relationship skills, and responsible decision-making.

### 3.1. Study design

Our approach to isolating the causal effects of the $X^3$ program employs an experimental research design that leverages random assignment of the timing of data collection at the student level. Outcome data were collected from the randomly assigned control group prior to participation in the program, whereas outcome data were collected after participation in the program from those randomly assigned to the treatment group. In order to keep data collection conditions between the treatment and control group as similar as possible, teaching-artists and classroom teachers participating in the program administered two separate survey instruments in regular classroom environments for all students participating in the $X^3$ program. One of the surveys was entirely comprised of items that measure our outcomes of interest, while the other survey was comprised of items used to assess students' prior engagement with arts and cultural activities. By random assignment, some students took the outcome-based survey prior to the start of the program, and then took the background survey after the conclusion of the program (control group). Treatment group students took the background survey prior to the start of the program and then took the outcome-based survey after the conclusion of the program. Outcome and background surveys were then linked by a unique student identifier. Randomly assigning survey administration in this manner allowed us to preserve confidence in the internal validity of our findings, optimize statistical power by randomizing at the student level, and address validity concerns pertaining to the use of repeated measures.

### 3.2. Sample

Our population of interest was all students participating in the $X^3$ program over the course of the 2021-22 academic year. Our final study sample was comprised of students in five Title 1 elementary schools serving students in grades from prekindergarten through 5$^{th}$ grade; one additional school was dropped from the study due to issues with survey administration. The five schools enroll predominantly historically-underserved students. Ninety-nine percent of students enrolled were eligible for free lunch, 79% were Hispanic, 15% Black or African-American, 3% White, and 3% Asian.

The school principals in our study all selected their 3$^{rd}$ or 4$^{th}$ grade students to receive the $X^3$ program, giving us a population of 583 students. We collected at least one of two surveys from 578 students (99%); 410 students took both surveys and had their responses linked; 127 students took only the background-based survey; and 41 students took only the outcome-based survey. Survey participation by treatment status was neither practically nor statistically significant (differences were all equal to or less than one percentage point). Our preferred analytical sample is comprised of the 451 students who took the outcome-based survey. When we examine heterogeneous effects based on prior levels of cultural exposure, we rely on the sample of 410 students who took both the outcome-based survey and the background survey.

### 3.3. Data

Our outcome-based survey included dance enthusiasm items developed in coordination with the Houston Ballet. Items that captured students' sense of self-efficacy, school connectedness, school enthusiasm, and social awareness were adopted from established survey instruments (Boston Public Schools, 2021; Statewide CHKS, 2020; WestEd, 2020). Our background-based survey contained items about students' grade, sex, and prior arts and cultural engagement; students indicated whether they had previously

taken dance lessons, music or singing lessons, acting classes or been in a play, visited an art museum, visited a science museum, attended a ballet performance, attended a play or theater performance, or attended a concert. In our analysis, we use these responses to generate an index of prior cultural exposure to examine whether prior exposure moderates treatment effects.

To reduce the number of outcomes we examine, we consolidated individual survey items into constructs for dance enthusiasm, self-efficacy, and school connectedness through exploratory factor analysis. Measures of school enthusiasm and social awareness outcomes did not yield any significant findings; these results are available upon request but are excluded from our reported analyses for ease of exposition.

The dance enthusiasm construct (McDonald's omega = 0.76) captures how students rate their agreement with enjoyment, interest, and assessment of their dancing ability, and includes the following three items: "I enjoy dancing"; "I am interested in learning more about dance"; and "I am good at dancing." The three self-efficacy items (McDonald's omega = 0.65) had students assess their abilities to achieve goals: "I can learn to do anything if I try hard enough"; "I can reach the goals I set for myself"; and "I can meet all the learning goals that my teachers set for me." Finally, the four school connectedness items (McDonald's omega = 0.74) had students rate their sense of belonging, primarily in terms of peer relationships and sense of care and concern from others at their school: "I feel close to the people at my school"; "People at my school care about me"; "I make friends easily at school"; and "School is a place where I feel like I belong." We provide mean responses for individual survey items by construct and treatment status in Appendix A.

## 4. Analysis

The experimental design of this study provides a straightforward analytical strategy. We estimate treatment effects with the following reduced-form model:

$$Y_i = - + \beta DANCE_i + \mathbf{X}_i \gamma + \varepsilon_i$$

Where $Y$ signifies a standardized outcome of interest for student $i$; $DANCE$ is a dichotomous variable that indicates whether the student was randomly assigned to the treatment group; $X$ is a vector of student-level controls for grade level and sex; and ε is the error term. We estimate our model coefficients using robust standard errors.

We also conduct exploratory analyses to examine whether the dance treatment produces heterogeneous effects across subgroups of interest. These analyses provide preliminary information on subgroup effects that can guide future research. Previous studies have found that arts and cultural interventions tend to be more impactful with students from low income, Black or African-American, and Hispanic communities, who tend to have less access to arts learning opportunities (Bowen & Kisida, 2023; Catterall et al., 2012; Podlozny, 2000). We investigate heterogeneous effects stemming from students' prior cultural exposure using their responses to whether they had previously engaged in nine different arts and cultural experiences. Based on the percentage of activities that students engaged in, we created a dichotomous variable indicating whether students were above or below the median.

Due to the potential for baseline enthusiasm to moderate treatment effects, we also explore differences by sex. In our analyses of baseline data, we found significant and substantial differences in male versus female enthusiasm for dance. This potential interaction effect could go in either direction. Female students were more enthusiastic at baseline which could be critical to the success of the intervention; however, higher enthusiasm at baseline could lead to ceiling effects.

## 5. Results

Results for the full sample are provided in Table 1. We find two statistically significant results for the full sample using our preferred model that includes controls for students' sex and grade level. Participation in dance increases students' enthusiasm for dance by 0.30 of a standard deviation and self-efficacy by 0.17 of a standard deviation. The estimated effect on school connectedness is in the positive direction but fails to achieve statistical significance. Based on differences on individual survey items (Appendix A), the enthusiasm for dance effect appears to be primarily driven by increases in students' enjoyment of dance and self-assessments of their dancing ability.

Exploratory analyses of subgroup effects are presented in Tables 2 and 3. We find that the effect for dance enthusiasm is consistently significant and substantial across student subgroups. It is worth noting that male students exhibited treatment effects nearly twice the magnitude of female students (Table 2). Male students also appear to drive the significant effect on self-efficacy, with effects for males being more than twice of that of female students. Based on male students' lower levels of initial enthusiasm for

**Table 1.** Treatment effects: Full sample.

| | Dance enthusiasm | | Self-efficacy | | School connectedness | |
|---|---|---|---|---|---|---|
| Treatment | 0.306*** | 0.303*** | 0.144 | 0.167* | 0.037 | 0.031 |
| | (0.094) | (0.095) | (0.095) | (0.097) | (0.095) | (0.097) |
| Female | | 0.367*** | | 0.098 | | 0.087 |
| | | (0.093) | | (0.097) | | (0.096) |
| 3rd Grade | | 0.015 | | 0.079 | | 0.008 |
| | | (0.094) | | (0.102) | | (0.101) |
| Constant | −0.162 | −0.349 | −0.075 | −0.185 | −0.019 | −0.065 |
| | (0.075) | (0.103) | (0.073) | (0.105) | (0.071) | (0.111) |
| N | 451 | 440 | 444 | 433 | 446 | 435 |

*Notes*: *** statistically significant (two-tailed) at $p < 0.01$; ** at $p < 0.05$; * at $p < 0.10$; robust standard errors in parentheses. Dependent variables are standardized with a mean set equal to 0 and standard deviation of 1.

**Table 2.** Treatment effects by student sex.

| | Dance enthusiasm | | Self-efficacy | | School connectedness | |
|---|---|---|---|---|---|---|
| | Female | Male | Female | Male | Female | Male |
| Treatment | 0.205* | 0.386*** | 0.102 | 0.230* | −0.013 | 0.079 |
| | (0.124) | (0.142) | (0.140) | (0.136) | (0.138) | (0.136) |
| 3rd Grade | −0.062 | 0.076 | 0.104 | 0.051 | 0.113 | −0.090 |
| | (0.120) | (0.143) | (0.151) | (0.137) | (0.143) | (0.141) |
| Constant | 0.124 | −0.434 | −0.070 | −0.198 | −0.029 | −0.024 |
| | (0.120) | (0.131) | (0.152) | (0.130) | (0.140) | (0.140) |
| N | 210 | 230 | 210 | 223 | 209 | 226 |

*Notes*: *** statistically significant (two-tailed) at $p < 0.01$; ** at $p < 0.05$; * at $p < 0.10$; robust standard errors in parentheses. Dependent variables are standardized with a mean set equal to 0 and standard deviation of 1.

**Table 3.** Treatment effects by prior arts and cultural engagement.

| | Dance enthusiasm | | Self-efficacy | | School connectedness | |
|---|---|---|---|---|---|---|
| | Lower Exposure | Higher Exposure | Lower Exposure | Higher Exposure | Lower Exposure | Higher Exposure |
| Treatment | 0.312* | 0.327** | 0.381** | −0.028 | 0.338* | −0.156 |
| | (0.181) | (0.133) | (0.175) | (0.163) | (0.172) | (0.151) |
| Female | 0.517*** | 0.553*** | 0.240 | 0.088 | 0.211 | 0.088 |
| | (0.159) | (0.132) | (0.155) | (0.162) | (0.156) | (0.149) |
| 3rd Grade | 0.210 | 0.088 | 0.123 | 0.252 | 0.142 | 0.033 |
| | (0.162) | (0.133) | (0.162) | (0.171) | (0.161) | (0.160) |
| Constant | −0.679 | −0.335 | −0.439 | −0.226 | −0.406 | 0.039 |
| | (0.183) | (0.146) | (0.171) | (0.170) | (0.181) | (0.177) |
| N | 152 | 165 | 151 | 163 | 152 | 163 |

*Notes*: *** statistically significant (two-tailed) at $p < 0.01$; ** at $p < 0.05$; * at $p < 0.10$; robust standard errors in parentheses. Dependent variables are standardized with a mean set equal to 0 and standard deviation of 1.

dance, these findings suggest that such engagement is critical for relieving inhibitions. Moreover, addressing any such aversions could explain the coinciding increase in self-efficacy.

Based on prior research, we hypothesized that students with lower levels of arts and cultural exposure would experience greater treatment effects. We find support for this hypothesis when investigating subgroup effects on students' self-efficacy and school connectedness. Students with lower levels of arts and cultural engagement experience appear to drive the effect on self-efficacy; the effect is significant and substantial for students with lower levels of exposure and insignificant for students who had higher levels of arts and cultural experience. Students with lower levels of arts and cultural exposure also exhibit a positive effect on school connectedness, an effect not found with the full sample.

## 6. Discussion & conclusion

Employing an experimental research design to investigate the impacts of dance engagement with elementary-level students, we find positive impacts on students' interest in arts and cultural engagement, as reflected in their enthusiasm for dance. We also find that students' participation in dance positively affects their sense of self-efficacy. Findings from our subgroup analyses indicate that impacts with male students appear to drive enthusiasm for dance, and impacts with males and students with lower levels of arts and cultural engagement appear to drive the self-efficacy effect. Finally, we find that students with lower levels of prior arts and cultural engagement experience significant and substantial positive effects on their sense of school connectedness.

Our findings that dance has positive effects on student self-efficacy and school connectedness support theories that arts and cultural learning improve students' social-emotional learning and development (Catterall et al., 2012; Deasy, 2002; Farrington et al., 2019; Fiske, 1999; Konrath & Kisida, 2021). Though our data limit our ability to precisely isolate which mechanisms of the intervention are most salient, prior studies contend that arts and cultural learning opportunities increase student expression, collaboration, and

interaction, which can promote interpersonal relationship skills and improve school social capital (Barrett & Bond, 2015; Bowen & Kisida, 2023; Farrington et al., 2019; Hoxie & Debellis, 2014; Ruppert, 2006).

These findings also corroborate theoretical claims and prior empirical findings that schools can serve as viable means for addressing disparities in arts and cultural engagement. Addressing vast disparities in arts and cultural exposure and consumption has proven difficult given the multitude of barriers that have obstructed engagement (Blume-Kohout et al., 2015; Brook, 2016; Falk & Katz-Gerro, 2016). Efforts to use public schools as a mechanism to reduce inequalities in arts and cultural educational resources have not been as resounding as other education policies in the U.S. (Perera, 2023). This relative impassivity could be attributed to debates about schools' capacities, given the resources necessary to provide valuable arts and cultural engagement (Parsad & Spiegelman, 2012), questions regarding whether school-facilitated arts and cultural experiences can indeed mobilize later life engagement (Bourdieu, 1977; DiMaggio, 1982), and policy-related concerns regarding impacts on salient extrinsic educational outcomes (Heilig et al., 2010). The findings from this study support the contention that school arts and cultural engagement opportunities are indeed valuable experiences for students that bestow intrinsic as well as policy-relevant benefits.

The subgroup results imply that efforts to cultivate taste for arts and culture could be more impactful with populations initially averse to or less experienced with arts and cultural engagement. The connection between positive effects on dance enthusiasm and coinciding positive effects on self-efficacy is likely not spurious. Self-efficacy is inversely related to one's doubt of their learning capabilities (Schunk & Zimmerman, 2007). The students in our sample were generally positive on all survey items (see Appendix A), but at baseline, the control group's assessment of their dancing ability was much more negative. Assuming that students' relatively low baseline self-assessments are tied to self-doubt in their dancing capabilities, it is likely that increases in enthusiasm and perceived ability would improve one's general sense of self-efficacy.

It is difficult to determine which aspects of the dance program affected which outcomes, but certain program aspects closely aligned with those found to affect self-efficacy. The $X^3$ program's teaching-artists consistently stressed the importance of practice, collaboration, teamwork, positive feedback, and emphasized mastery through repetition and constant modeling of dance and movement steps, both from teaching-artists and fellow students. From our observations of the program, many students, especially those exhibiting lower levels of enthusiasm and past experience, often struggled with new dance sequences and would initially become frustrated. However, the teaching-artists consistently stressed that making mistakes and additional practice were part of the learning process. Over time, students became less discouraged when introduced to new dance sequences, more likely to encourage peers who struggled, and more confident in their group's ability to achieve mastery. Research has shown that supportive environments that instill this understanding of practice and use modeling, especially from peers, can be instrumental in promoting self-efficacy (McCormick & McPherson, 2003; McPherson & McCormick, 2006; Miksza & Tan, 2015; Schunk, 1987; Schunk & DiBenedetto, 2020).

The findings from this study also contribute to the relatively nascent field of dance education research. There have only been a few experimental studies that have investigated the educational impacts of students' engagement in dance (Winner et al., 2013). Our findings support the further development of theory specifically regarding dance education and its effects. Arts and cultural education, from a policy perspective, is often treated as a monolith (Holochwost et al., 2021). However, learning experiences that fall under this broad umbrella are remarkably diverse in terms of their objectives and the ways in which they engage students. Experimentally investigating causal relationships for different arts disciplines and modes of engagement will help to more precisely determine whether and which effects are common across arts and cultural educational opportunities versus those that are particular to certain disciplines and modes.

There are noteworthy limitations to this study. As with most experiments, this study was conducted in a localized, particular setting. Sampling restrictions inhibit our ability to generalize results with confidence, but our design allows us to infer causal relationships with great certainty (Shadish et al., 2001). Specifically, our sample was confined to elementary schools that opted to partner with the Houston Ballet to provide students this dance educational experience. These effects may not transfer to schools where principals do not seek out or eagerly welcome such arts and cultural educational opportunities.

As noted earlier, we focus and rely on measures of cultural exposure and consumption derived from interpretations of Bourdieu's (1977) definition of

cultural capital to delineate cultural engagement (Lareau & Weininger, 2003). We limited our focus to these forms of cultural exposure and consumption due to survey space constraints and because a vast literature has shown that these forms of engagement bestow extrinsic benefits that are likely of interest to education policymakers (e.g., DiMaggio, 1982; Dumais, 2002; Kisida et al., 2014; Sullivan, 2001). While this conceptualization has been common in education policy research due to its predictive power of salient outcomes, e.g., high school grades (DiMaggio, 1982), this framework relies on a conceptualization of cultural engagement that emphasizes Western European cultural institutions and, therefore, may not capture broader forms of engagement (Novak-Leonard et al., 2014; 2015).

We contend that this choice of measure arguably has value from a policymaking lens, but also recognize that it may not sufficiently correlate with broader conceptualizations of cultural engagement. This limitation does not impact our main findings due to the randomization process ultimately ensuring that prior levels of students' cultural engagement, however conceptualized, remains statistically equivalent when comparing treatment and control groups. However, this limitation is worth consideration when interpreting our subgroup analyses that examine effects by students' prior levels of cultural engagement. For example, our definition of "high" and "low" cultural exposure may be more influenced by students' SES than if we had used measures of cultural exposure that are less reflective of social and class differences in preferences and opportunities. Consequently, this analysis may misattribute differences in effects by students' prior cultural exposure without adequate attribution to the influence of SES.

Another limitation of this study is that we were only able to assess short-term outcomes. The effects from this study could fade, materialize, or strengthen over time. Unfortunately, we were not permitted to track students beyond the evaluation period. Further investigation is necessary for examining the generalizability and durability of these effects.

Despite these limitations, our findings have important policy implications for the roles that schools can play in nurturing arts and cultural engagement and the effects of dance education on cultural interests and social-emotional development. Based on related research, it is likely that increased enthusiasm for these types of cultural experiences will carry over into adulthood. We also find positive dance effects on two measures of social-emotional development: self-efficacy and, for students with lower baseline arts and culture exposure, school connectedness. Recent studies have shown that such social-emotional impacts confer a host of educational benefits, such as improving students' attendance rates, higher graduation rates, and higher college attendance rates (Jackson, 2018, Jackson et al., 2020). Policymakers should take these benefits into consideration when assessing the value of providing arts and cultural engagement opportunities in schools.

## Note

1. For the purposes of this study, we employ and refer to measures of cultural exposure and consumption derived from interpretations of Bourdieu's (1977) definition of cultural capital to delineate cultural engagement (Lareau & Weininger, 2003). This conceptualization has been common in education policy research due to its predictive power of salient outcomes, e.g., high school grades (DiMaggio, 1982). This framework potentially relies on a relatively narrow conceptualization of cultural engagement that disproportionately emphasizes those historically stressed in Western European cultural institutions and, therefore, may not fully capture broader cultural engagement (Novak-Leonard et al., 2014; Novak-Leonard et al., 2015). For example, we ask students whether they had participated in dance lessons as a means to gauge dance engagement. We chose to ask specifically about dance lessons because it aligns more with those derived from interpretations of Bourdieu's definition of cultural capital; asking specifically about dance lessons also has desirable measurement properties, such as being a more reliable measure than simply asking students whether they have dance experience. However, one issue with this approach is that experience with dance outside of formal lessons would not be captured in our data. We further discuss the measurement implications and limitations of this conceptualization in our Discussion & Conclusion section.

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## Ethical approval

This study was reviewed and approved by Texas A&M University's Institutional Review Board (IRB2019-0772).

## Disclosure Statement

No potential conflict of interest was reported by the author(s).

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## Appendix A

**Table A1.** Survey outcomes: Individual items.

| Item | *N* | Treatment | Control | Effect Size |
|---|---|---|---|---|
| Dance Enthusiasm | | | | |
| I enjoy dancing. | 450 | 5.025 | 4.394 | 0.392*** |
| | | (0.090) | (0.122) | (0.094) |
| I am interested in learning more about dance. | 448 | 4.426 | 4.376 | 0.030 |
| | | (0.101) | (0.121) | (0.095) |
| I am good at dancing. | 448 | 4.144 | 3.594 | 0.298*** |
| | | (0.112) | (0.133) | (0.094) |
| Self-Efficacy | | | | |
| I can learn to do anything if I try hard enough. | 443 | 5.100 | 5.047 | 0.035 |
| | | (0.096) | (0.105) | (0.095) |
| I can reach the goals I set for myself. | 440 | 4.811 | 4.599 | 0.134 |
| | | (0.097) | (0.117) | (0.096) |
| I can meet all the learning goals that my teachers set for me. | 443 | 4.857 | 4.637 | 0.147 |
| | | (0.095) | (0.107) | (0.095) |
| School Connectedness | | | | |
| I feel close to the people at my school. | 443 | 4.277 | 4.189 | 0.051 |
| | | (0.111) | (0.122) | (0.095) |
| People at my school care about me. | 443 | 4.299 | 4.175 | 0.069 |
| | | (0.115) | (0.128) | (0.095) |
| I make friends easily at school. | 442 | 4.526 | 4.500 | 0.015 |
| | | (0.112) | (0.124) | (0.096) |
| School is a place where I feel like I belong. | 441 | 4.284 | 4.377 | −0.053 |
| | | (0.116) | (0.123) | (0.095) |

*Notes*: *** statistically significant (two-tailed) at $p < 0.01$; standard errors in parentheses. Unstandardized items scaled 1-6 with 6 being the highest level of agreement. Effect sizes standardized with a mean set equal to 0 and standard deviation of 1.