



# PLANTING THE SEEDS:

## *Assessing the Impact of Orchestral Music Education in the Lives of Young Children*

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Longy School of Music of Bard College prepares musicians to make a difference in the world. Longy is a degree-granting conservatory in Cambridge, MA with an additional campus in Los Angeles, CA. We offer a full spectrum of performance, composition, and teaching programs, including a new Master of Music in Music Education (Cambridge) and a Master of Arts in Teaching (Los Angeles), the nation's first one-year, *El Sistema*-inspired degree programs.

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# INTRODUCTION

## *Why does musical instrument education matter?*

Unlike eye color or hair color, children are not born knowing how to handle risks and failures. This attitude, often called a growth mindset, develops over time and is shaped by experiences with learning, appraisal, and feedback.

While often treated as a characteristic and/or a responsibility of individuals, our research argues that a young person's growth mindset is not only the result of their efforts, but also shaped by peers, adults who teach and model, and the expectations of the institutions and ecologies in which they develop. Developing growth mindset is critical to successful learning – in school and in life – and, thus a shared, rather than individual responsibility (De Leon et al, 2018; Wolf et al, 2019).

To this point, research shows that experiences like racism and poverty can stunt or erode the development of a growth mindset (Yoshikawa et al., 2012; Claro et al., 2016) (i.e., constant messages that a child's race or wealth pre-determines their capacity to learn can have a corrosive effect). Steady messages about growth and possibility can have the opposite effect.

Therefore, as we confront the profound inequities in formal and informal education, we need to promote opportunities that challenge the systems and isms that prevent children from believing in their potential and their worth. One such activity may be learning how to play a musical instrument (Wolf et al, 2019).

Learning how to play a musical instrument requires young people to master a series of increasingly difficult tasks (Hallam et al, 2012). For example, a first time violinist may have a teacher that instructs her to tackle a D major scale after mastering both G major and C major. This a slightly more difficult task as it involves an additional sharp than the G major scale – two altogether. When done thoughtfully and with support, the introduction of additional scales encourages a student to wrestle with and, perhaps even, find excitement in mastering tasks of increasing difficulty over time.

The development of a growth mindset is not limited to one-on-one teaching scenarios. Consider a conductor in a chamber music or orchestra setting; over the course of the year, or perhaps over the course of several years, she may ask her youth orchestra to perform increasingly difficult and complex repertoire, encouraging collaborative growth, achievement, and perhaps mastery over

### **What is Growth Mindset?**

To have a growth mindset is to view your abilities as malleable as opposed to fixed (Dweck, 2009). It is not only the belief that you can change and progress over time, but also the belief that failure is not the end. As opposed to saying, "I can't do it", you say "Let me try again" or "I can learn something from that".

"Children who possess a growth mindset believe that the harder they work at something, the better they will be at it (Mrazek et al., 2018). Accordingly, they tend to choose more challenging tasks (Dweck and Leggett, 1988; Blackwell et al., 2007), view setbacks as opportunities to learn and improve (Davis, 2016; Burnette et al., 2018), and exhibit persistence and strategy shifting in the face of challenges (Hong et al., 1999)" (Holochwost et al, 2021).



time. In group settings, it is also powerful for students to watch their peers risk, fail, and recover with the help of a teacher who frames mistakes and difficulties as learning opportunities.

To date, the claims and assertions that learning how to play a musical instrument might promote benefits beyond instrument mastery to the development of a growth mindset have outpaced the rigorous research to support them. Our study is an effort to change that.



## OUR STUDY

To assess the potential of developing both a musical and overall growth mindset through learning how to play a musical instrument, we partnered with *El Sistema* programs across the country. These programs were selected because:

- They exist across a variety of communities and geographies.
- They are low cost or free to participants, eliminating traditional barriers to musical instrument education.
- The majority of enrolled students are from Black and Latinx communities.

### History of *El Sistema*

The programs participating in this study all identified as *El Sistema*-inspired youth music programs. *El Sistema* was founded by Jose Abreu in 1975 in Venezuela. It is a non-profit, music education program that provides intensive musical training as an “antidote to the ills of poverty”. Since its founding, it has garnered global acclaim and acquisition – even expanding into the US to support 115 organizations in 34 states and territories.

In the US, the mission of *El Sistema* is “to support and grow a nationwide movement of programs inspired by *El Sistema* to effect social change through music for children with the fewest resources and the greatest need.” As of 2019, the program has interacted with at least 20,000 students and 1,500 teaching artists.

To learn more about the *El Sistema* program, [visit their website](#).



Photo Credit: Longy School of Music



To be included in the study, the *El Sistema*-inspired programs were required to offer at least weekly instruction on an orchestral instrument to students in grades 3-5. During each program, teaching artists led students in small (chamber music) and large (orchestra) group settings. The majority of programs took place after school. On average, students from participating programs received 231 hours of musical instruction per year. The programs were all well-established, allowing students to potentially have up to three years of involvement/exposure. As such, we could assess, for example, whether students with three years of participation in *El Sistema* had different outcomes than their peers who had gone without music education for three years.

## RESEARCH QUESTIONS

By engaging with 12 *El Sistema*-inspired orchestra programs from across the country, we set out to answer the following research questions:

1. Does learning to play a musical instrument have an impact on young children's musical growth mindset (i.e., what evidence is there of near transfer of growth mindset)?
2. Does learning to play a musical instrument have an impact on the development of young children's overall growth mindset (i.e., what evidence is there of far transfer of growth mindset)?

### What is Musical Growth Mindset?

Musical growth mindset is a domain specific version of the general growth mindset as defined by Carol Dweck (2009). For example, when a young musician struggles with but continues to practice a difficult passage in a new piece, they are embracing the challenge and believing in their potential to achieve mastery.

When these experiences become habits a student applies to all of their playing, there is a *near* transfer of attitudes and mindsets to the field of music.

Our team hypothesized that students enrolled in the *El Sistema*-inspired programs would exhibit higher levels of musical and overall growth mindset at the end of the academic year than their peers who were not enrolled in similar programs. We also hypothesized that musical growth mindset would increase in a way that was statistically significant – that is, beyond a margin of error that could readily be attributed to chance.



Photo Credit: Longy School of Music



## PARTICIPANTS:

Our study ran across 2 consecutive academic years – 2015-2016 (Cohort 1) and 2016-2017 (Cohort 2) – and engaged with 497 students. (See Figure 1 “Programs and Participants” to learn more on the following page.)

## MEASURES:

Students enrolled in the program and a comparable group of unenrolled students were given a pair of surveys twice each program year: one within two weeks into the program year starting and the second within two weeks of the program year ending. This allowed our team to assess potential change over time.

Both surveys were adapted from Carol Dweck’s six-item measure to assess growth mindset (Hong et al., 1999; Blackwell et al., 2007; Dweck, 2009). One survey assessed a student’s overall conception of growth mindset; this was administered to enrolled and unenrolled students. The other assessed a student’s musical growth mindset in the specific context of instrumental music; this was only administered to enrolled students.

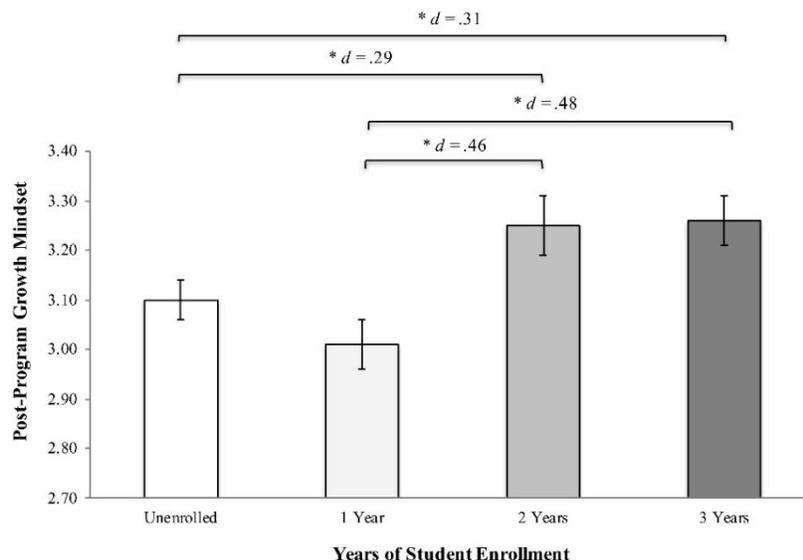
## OUR FINDINGS:

### *How does musical instrument education matter?*

Our analyses revealed new insights into the potential of ensemble instrumental training to develop growth mindset.

**MUSICAL GROWTH MINDSET:** Regardless of the number of years of enrollment in the El Sistema program, students who had been enrolled in the program showed significant increases in their musical growth mindset. In other words, regardless of the number of years of exposure, it’s possible that exposure to musical education increases musical growth mindset in children.

**Figure 2: Post-program overall growth mindset scores by years of student enrollment.**



Note that the brackets indicate significant Tukey-adjusted contrasts ( $p < 0.05$ ), and  $d$  values correspond to effect sizes calculated by dividing the difference in the model-implied estimates for each pair of groups by the pooled standard deviation of pre-program overall growth mindset scores.

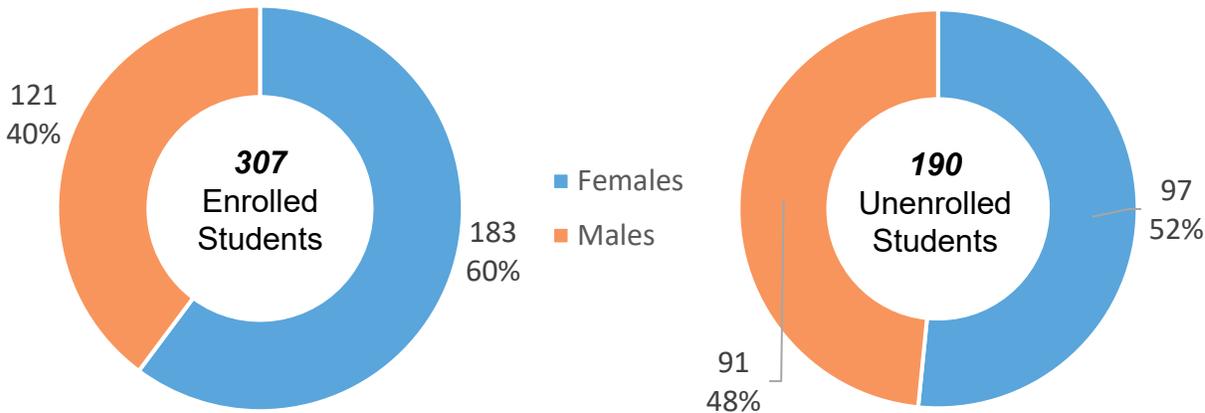
# PROGRAMS & PARTICIPANTS

Between 2015 and 2016, nearly 500 students were involved in our research project with 12 *El Sistema* inspired programs from across the country. Their demographic information is highlighted below.

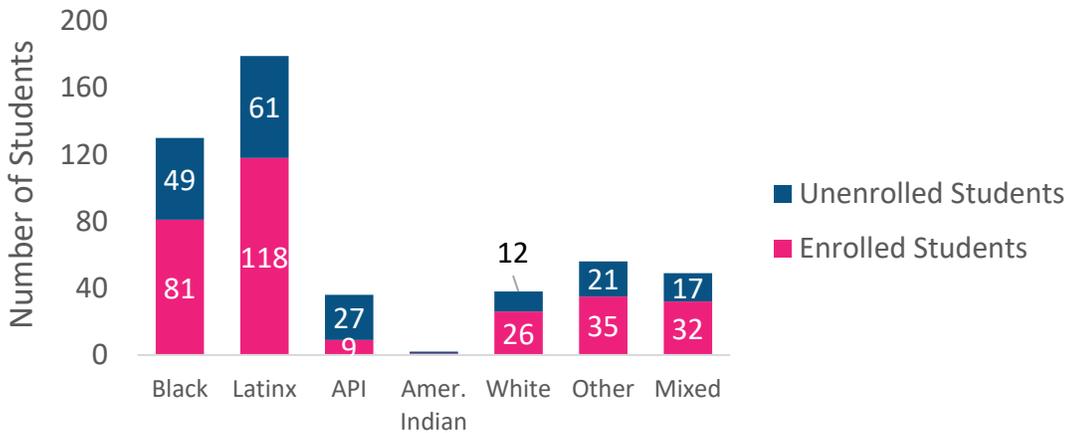
**12** orchestral programs participated in the study across both academic years.

**497** students were included through treatment and control groups.

## Enrollment Status by Gender



## Enrollment Status by Ethnicity



## Enrollment History within *El Sistema* Programs





**OVERALL GROWTH MINDSET:** There was no statistically significant difference in overall growth mindset for students who were enrolled in the *El Sistema* programs and those who were not from the beginning to the end of the year. However, there were significantly different results for students who had been enrolled in the program for two or more years when compared to their counterparts. More specifically, students engaged in sustained instrumental playing showed higher levels of growth mindset than their non-participating peers. In other words, there is promising evidence that sustained engagement in instrumental music impacts overall growth mindset in children.

*Students engaged in sustained instrumental learning playing for two or more years showed higher levels of growth mindset than their non-participating peers.*

## DISCUSSION:

This pattern of findings presents the role that musical instrument education and playing could have in the development of both domain-specific and broader growth mindset.

These findings also point to an important conversation about “dose” and the transferability of musical growth mindset to overall growth mindset. More specifically, it raises the possibility that it takes sustained musical engagement before the habits of young musicians spill over into a more generalized growth mindset that they carry with them into other learning situations.

Finally, this research, along with the accompanying qualitative data (Wolf et al, 2019) suggests a reconceptualization of growth mindset as an outlook that results when a child, their peers, teachers, and institutional settings (De Leon et al, 2018) promote and reinforce an openness to effort, productive errors, and recovery.

### *Considerations for Further Research*

Our findings contribute to the contemporary effort to create a rigorous research foundation for measuring the wider benefits of arts education. At the same time, they are limited. To solidify them, additional research that addresses the following is needed:

- **Longitudinal Design:** While our study was able to consider past enrollment in *El Sistema* programs, we were only able to measure the students over the course of a single year. Future studies should pursue longitudinal designs, in order to draw stronger causal inferences.
- **Experimental Design:** If possible, it would be highly beneficial for future research to incorporate random assignment thus overcoming any possible biases stemming from self-selection into music programs.
- **Greater Geographic Variation:** Our research was conducted entirely in US schools. For greater applicability, future research should extend beyond one country and assess the implementation of the program more broadly.



- **Pedagogical Considerations:** Our research was based on the structural features of musical education (e.g., hours of instruction per week, small and large group settings, etc.) as opposed to the pedagogical features (e.g., feedback opportunities, collaborative opportunities, etc.). Future research should endeavor to collect and codify teacher behaviors to best understand how they, in a musical setting, may facilitate the development of a growth mindset.

### Key Takeaways

- Although it is not possible to claim that instrumental music education causes the development of either generalized or music-specific growth mindset at this time, our research lays the foundation for pursuing that assertion.
- Growth mindset, usually conceived as an attitude that an individual develops, may better be understood as resulting from an ecology (individual, peers, teachers, and institutional opportunities). Such a reconceptualization places responsibilities on the social and institutional environments we design for all children.

## FURTHER LEARNING

For additional information about the research, methodologies, and results, please refer to the full article:

Holochwost SJ, Bose JH, Stuk E, Brown ED, Anderson KE and Wolf DP (2021) Planting the Seeds: Orchestral Music Education as a Context for Fostering Growth Mindsets. *Front. Psychol.* 11:586749. doi: 10.3389/fpsyg.2020.586749

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To learn more about WolfBrown, go to [www.wolfbrown.com](http://www.wolfbrown.com).

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This research draws on the following major sources:

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