

# BRAVO

YOUTH ORCHESTRAS



## 2024-2025 EVALUATION

March 2026

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# EXECUTIVE SUMMARY

Since 2013, BRAVO Youth Orchestras has provided ensemble music instruction in the Roosevelt cluster of K-12 schools in North Portland. Part of the international El Sistema movement, BRAVO is grounded in the belief that music, community, and social justice can work together to expand opportunities for young people. The program serves students in a community that has historically experienced underinvestment, offering sustained access to music education and a supportive learning environment.

This evaluation examines BRAVO's role in students' educational experiences during the 2024-2025 school year. It combines student survey data with school and program administrative records on enrollment, attendance, disciplinary events, and academic achievement. To understand how BRAVO students' outcomes compare with similar peers, the evaluation used a rigorous propensity score matching approach to identify a comparison group of students with similar characteristics who did not participate in the program.

## KEY FINDINGS

### 1. BRAVO students had stronger attendance outcomes than similar peers

BRAVO's clearest measurable impact was on school attendance.

Compared with a rigorously matched group of similar students, BRAVO participants had **average daily attendance rates that were 3.6 percentage points higher**.

Over the course of a school year, this difference translates into approximately **6.5 additional days of school attendance**. Moreover, BRAVO students were also **13 percentage points less likely to experience chronic absenteeism**.

In practical terms, this means BRAVO students were consistently more present for instruction, increasing their access to learning time and school-based supports. Because attendance

is a foundational predictor of academic success, these differences represent a meaningful improvement in students' opportunity to learn. The findings align with broader research suggesting that participation in meaningful extracurricular activities can strengthen students' connection to school and support improved attendance.

## 2. BRAVO students showed substantial gains in engagement and perseverance

Beyond attendance outcomes, **BRAVO students reported meaningful increases in their engagement (+4%) and perseverance (+3%)** between the beginning and end of the school year.

Together, these results suggest that **participation in BRAVO is associated with positive shifts in students' sense of agency and their willingness to persist when tasks become hard.**

Engagement measures students' sense of voice, curiosity, and active participation. It reflects whether they feel empowered to express their ideas, take intellectual risks, and contribute fully. Perseverance reflects students' ability to work through challenging material and maintain confidence when learning becomes difficult.

## 3. Students developed a strong identity as musicians and connection to staff

BRAVO participants also reported **a strong sense of connection to the program and its staff.** They ranked "being a musician" as core to their identity and felt program staff cared about them, their families, and their community.

Students also **reported growing agreement (+8%)** that BRAVO teaches content relevant to their culture. These findings highlight the importance of relationships and identity development within the program's learning environment.

## 4. Recruitment and retention are a programmatic focus

At the program level, like many programs serving youth, **BRAVO continues to rebuild student participation** following disruptions caused by the pandemic.

During the 2024-2025 school year, the program served 106 students across 7 schools. Most participants were in the elementary grades, with noticeably lower enrollment in middle school—likely reflecting pandemic-related interruptions that affected earlier cohorts.

Three-quarters of participating students were new to the program (73%), highlighting the significant effort required to recruit and onboard new cohorts of beginner musicians. Compared with the broader school population, BRAVO participants were somewhat more likely to be female and less likely to be English learners or Hispanic students.

## 5. Other outcomes showed no detectable difference this year

This year, the evaluation did not find measurable differences in disciplinary events or academic achievement between BRAVO and the matched comparison group. These findings are limited by the modest sample size; continuing to track them longitudinally will be beneficial as sample sizes grow and students remain in the program across multiple years.



## Conclusions & Strategic Directions

Findings from this evaluation point to several encouraging signals about BRAVO's role in students' lives. Compared with similar peers, BRAVO students attended more school—equivalent to more than an additional week of instruction over the course of the year. Students also reported positive shifts in engagement and perseverance, and expressed a strong sense of identity as musicians. Together, these findings suggest that BRAVO is strengthening students' motivation, relationships, and connection to school. In the context of Oregon's ongoing challenge with chronic absenteeism, programs like BRAVO that foster belonging and excitement can play an important role in helping students stay engaged in school.

Based on the evaluation findings and a collaborative sense-making process with BRAVO's leadership team, five strategic opportunities emerged to support the program's continued growth. First, BRAVO can strengthen the student pipeline by supporting recruitment, re-enrollment, and transitions from early elementary grades through middle school. Second, targeted outreach may help ensure that BRAVO more fully reflects the diversity of the Roosevelt cluster community, particularly among Hispanic students. Third, investing in Teaching Artist retention and continuity can help sustain the trusted adult relationships that are central to student engagement and attendance.

Additional opportunities include intentionally leaning into students' identity as musicians and strengthening data systems to support continuous improvement. Together, these strategies focus on reinforcing the conditions that support long-term participation and ensuring that more students experience the full benefits of sustained involvement in BRAVO.



# INTRODUCTION

Since 2013, BRAVO Youth Orchestras has provided ensemble music instruction in the Roosevelt cluster of K-12 schools in North Portland. Part of the international El Sistema movement, BRAVO is grounded in the belief that music, community, and social justice can work together to expand opportunities for young people. The program serves students in a community that has historically experienced underinvestment, offering sustained access to music education and a supportive learning environment.

This evaluation examines BRAVO's role in students' educational experiences during the 2024-2025 school year. It combines student survey data with school and program administrative records on enrollment, attendance, disciplinary events, and academic achievement. Contextually, it was launched in tandem with the development of a new strategic plan and the rebuilding of student cohorts following pandemic disruptions.

To understand how BRAVO students' outcomes compare with similar peers, the evaluation used a rigorous propensity score matching approach to identify a comparison group of students with similar characteristics who did not participate in the program. Additional methodological details are provided in the Appendix.

## KEY FINDINGS

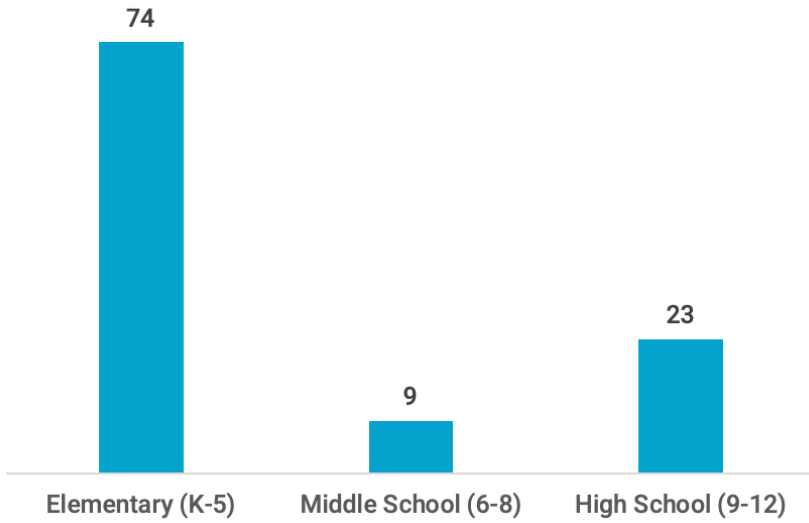
### Inclusion

#### Evaluation Question: Who participates in BRAVO?

By linking BRAVO program records with PPS' administrative data, we found that BRAVO served 106 students in 2024-25. These students attended eight schools in the Roosevelt cluster: Astor K-8, Cesar Chavez K-8, James John Elementary, Peninsula Elementary, Rosa Parks Elementary, Sitton Elementary, George Middle, and Roosevelt High School.

As shown below, the majority of BRAVO students were enrolled in the elementary grades (K-5), with a sizeable cohort also participating at the high school level. Middle school had the fewest participants.

### BRAVO Students by Grade Level

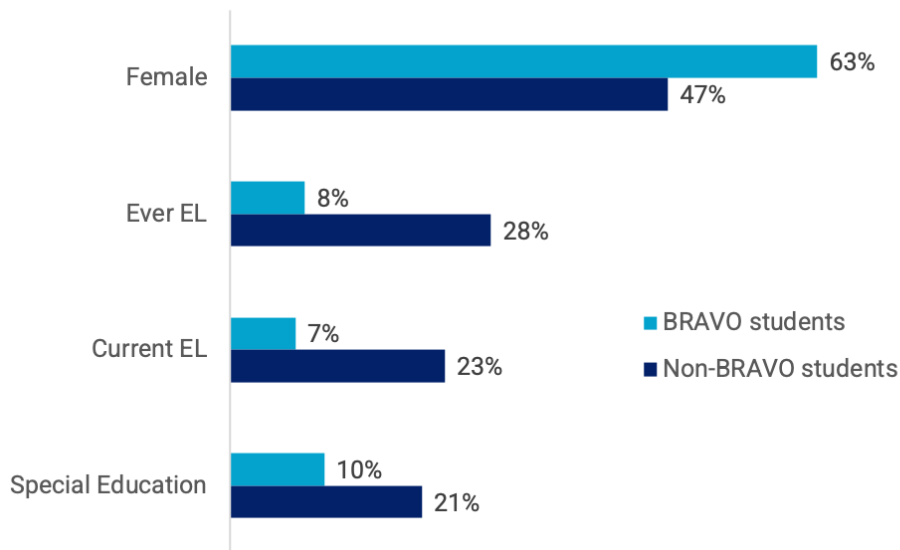


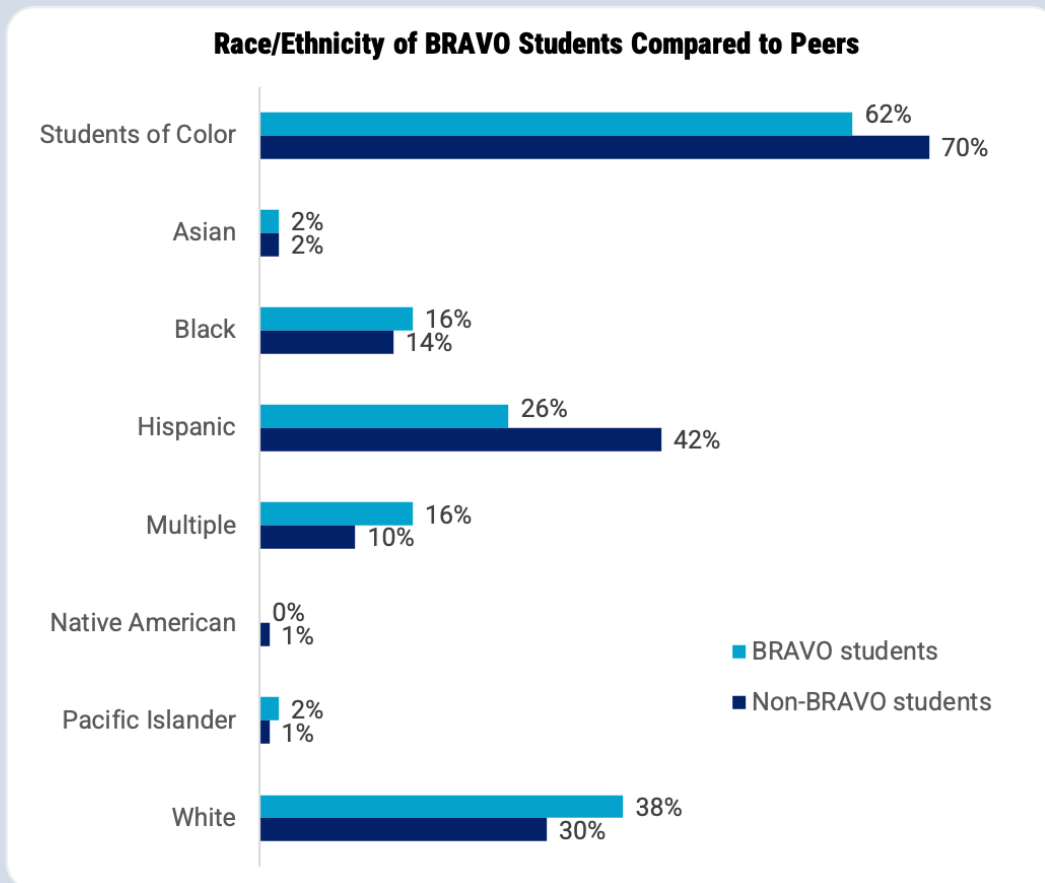
This distribution aligns with program staff reports of a decline in enrollment during and immediately following the pandemic; the cohort most affected is now in middle school. In response, BRAVO staff have prioritized recruitment of a new cohort of younger students, reflected in the current K-5 enrollment numbers.

We also examined the degree to which BRAVO students reflect the broader student body. As shown in the figures that follow, compared to other students at the same schools, BRAVO students were:

- More likely to be female
- Less likely to be a current or former English learner
- Less likely to be eligible for special education services
- Less likely to be students of color overall, largely driven by a lower proportion of Hispanic students

### BRAVO Students Compared to Peers





## Evaluation Question: How long do students remain in BRAVO?

Program records indicate that approximately **73 percent of students participating in BRAVO in 2024–25 were new to the program**, while **27 percent were returning participants**. This suggests that the current cohort includes a large proportion of first-time students and beginner musicians.

As BRAVO continues rebuilding program cohorts following pandemic-era disruptions, the program may serve many first-time participants each year. It also raises the question of retention of students from year to year; retention patterns will be examined more deeply in next year’s evaluation, when longitudinal data are available.

The balance between **new enrollment and returning participation** raises important questions about how students move through the program over time. Sustained participation is particularly relevant for BRAVO, where musical skill development, ensemble cohesion, and student identity as musicians often deepen through multiple years of involvement. Ensembles with a large proportion of beginning

students may also present instructional challenges, as staff must balance foundational skill development with maintaining progress for more experienced players.

## Evaluation Question: What are the perceived successes and challenges of recruiting and retaining students?

Recruitment and retention patterns will be examined more deeply in next year's evaluation, when additional years of program data will allow for longitudinal analysis of student participation. Future evaluation activities will also incorporate the perspectives of BRAVO staff to better understand the program's current recruitment strategies, the factors that encourage students to remain engaged, and the barriers that may influence whether students continue participating from year to year.



## Evaluation Questions: To what extent does BRAVO positively affect students' sense of belonging and community? To what extent does BRAVO foster community, across students, families, and the surrounding neighborhood?

Community and belonging are central elements of the El Sistema approach, which emphasizes music not only as a vehicle for artistic development but as a means of strengthening relationships among students, families, and the broader community. Within this framework, programs aim to create shared environments where young people feel valued, connected, and supported while participating in a shared musical endeavor.

The ESUSA survey of BRAVO students—administered at the beginning (“pre”) and end (“post”) of the school year—includes several items designed to capture students' perceptions of community and climate within the program. Four of these community-focused items are shown in the table below.

SURVEY ITEM	PRE	POST	CHANGE
The program teaches content that is relevant to my culture.	0.62	1.09	8%
The program staff are welcoming to my family.	1.75	2.02	5%
The program staff care about my community.	1.81	2.00	3%
The program staff care about me.	1.82	2.04	4%

**NOTE:** Each survey item was rated on a scale of -3 to +3, with higher values indicating stronger agreement with positively-worded statements.

Students reported consistently positive perceptions of BRAVO's relational climate, with modest but meaningful increases across all four items over the course of the school year. Ratings that program staff care about students, their families, and their broader community were already high in the fall and increased slightly by spring, suggesting strong and sustained trust between students and staff.

The largest increase occurred in perceptions that the program teaches content relevant to students' culture, which rose eight percent during the year. Together, these findings indicate that BRAVO not only maintains a strong foundation of relational support, but also deepens students' sense that the program reflects and affirms their cultural identities.

Additional survey findings reinforce the importance of this sense of belonging. When BRAVO students were asked to identify the ten aspects of life most central to their identity, they ranked "the school I attend" as number one and "being a musician" as number two. This suggests that participation in BRAVO may play a meaningful role in how students see themselves.

## Evaluation Question: What are the perceived successes and challenges in this area?

Survey results point to several areas of strength in BRAVO's approach to building community: students feel cared for by program staff and welcomed alongside their families, indicating that BRAVO has established a relationally-strong program environment. Growth in perceptions that the program reflects students' cultural backgrounds further suggests that BRAVO is making progress towards its goal of creating musical experiences that reflect the diversity of the surrounding neighborhood.

At the same time, understanding how community is experienced across the broader BRAVO ecosystem will require additional qualitative data. Future phases of the evaluation will incorporate focus groups and staff perspectives to better understand how BRAVO builds community in practice, what factors contribute most strongly to students' sense of belonging, and where opportunities may exist to strengthen engagement with families and the broader community.

### Social Emotional Development

## Evaluation Question: How does participation in BRAVO affect students' social-emotional development?

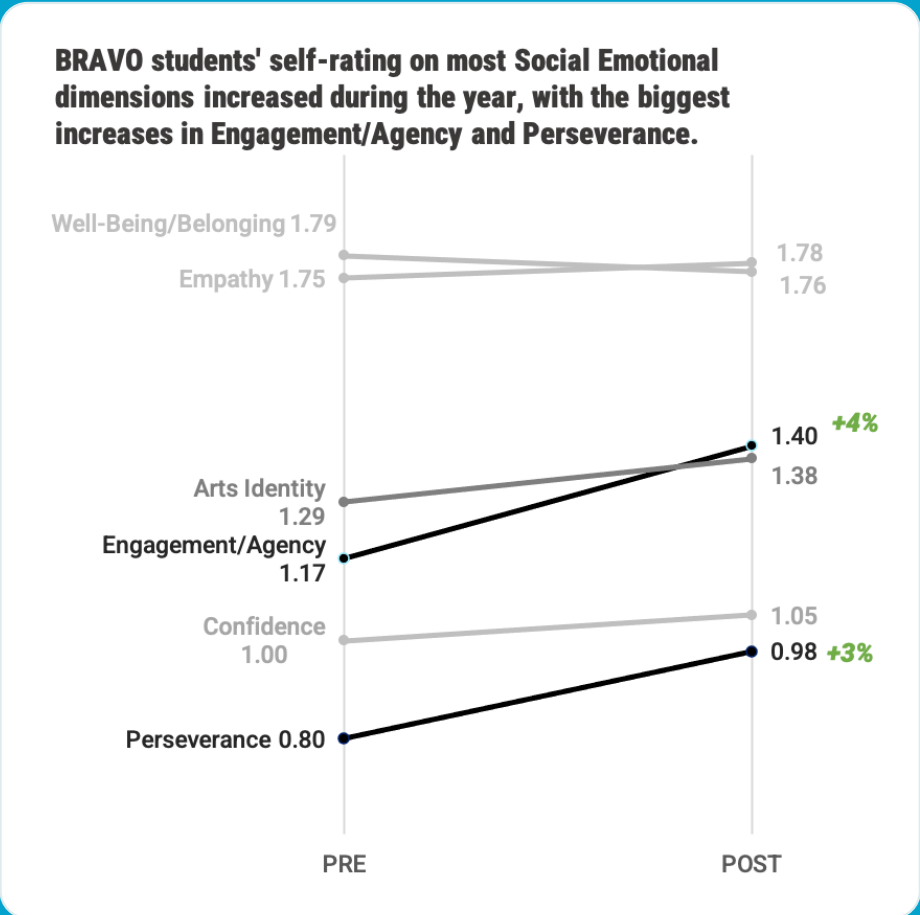
Participation in music ensembles often requires more than technical skill development. Learning an instrument is a challenging endeavor, and learning to play alongside others adds an additional layer of collaboration and interpersonal connection. Programs like BRAVO provide opportunities for students to build confidence, collaborate with peers, persist through challenges, and engage in hands-on learning. These dimensions of social-emotional development are important because they shape how students engage with both music and school more broadly.

To address this evaluation question, we again turned to ESUSA survey administered at the beginning (“pre”) and end (“post”) of the school year. The survey includes multiple questions related to students’ confidence, engagement, perseverance, empathy, well-being, and arts identity.

Rather than examining each question separately, we grouped related items into a smaller number of *indices*—broad measures that summarize patterns across multiple survey questions. These indices reflect established domains of social-emotional development and provide a clearer picture of overall trends than any single survey question alone.

As shown in the figure below, students’ average ratings increased across most social-emotional dimensions over the course of the school year. **The largest gain occurred in Engagement/ Agency, which increased by four percent from fall to spring.** This index includes 7 items that measure students’ sense of voice, curiosity, and active participation. In practical terms, it reflects whether students feel empowered to express their ideas, take intellectual risks, and engage fully in their learning.

**Note:** Each index is on a scale of -3 to +3, with higher values indicating stronger agreement with positively-worded statements.



**Students also showed meaningful growth in Perseverance, with scores rising three percent.** The Perseverance index includes three items measuring not giving up on goals and belief in one’s own capacity to learn anything. This dimension reflects students’ willingness to continue working through challenges and maintain belief in their capacity to improve.

Taken together, these findings suggest that participation in BRAVO is associated with positive shifts in students’ sense of agency and their willingness to persist when learning feels challenging. Ensemble music-making requires sustained effort, collaboration, and practice, and the survey results indicate that students may be developing these dispositions through their participation in the program.

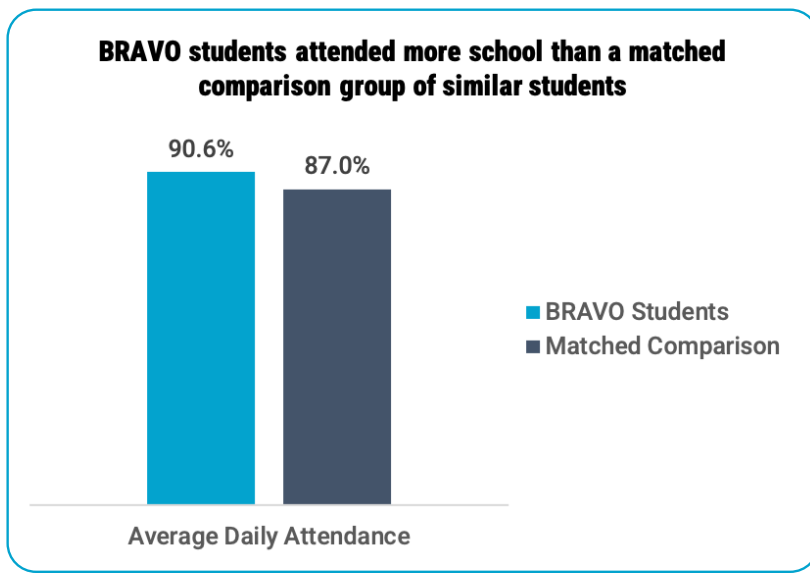
## Attendance

### Evaluation Question: Does participation in BRAVO lead to improved student attendance?

Prior research has shown that participation in meaningful extracurricular activities can strengthen students’ connection to school and, in turn, improve attendance. Based on feedback from previous BRAVO cohorts, we hypothesized that participation in BRAVO may provide students with an added incentive to attend school regularly.

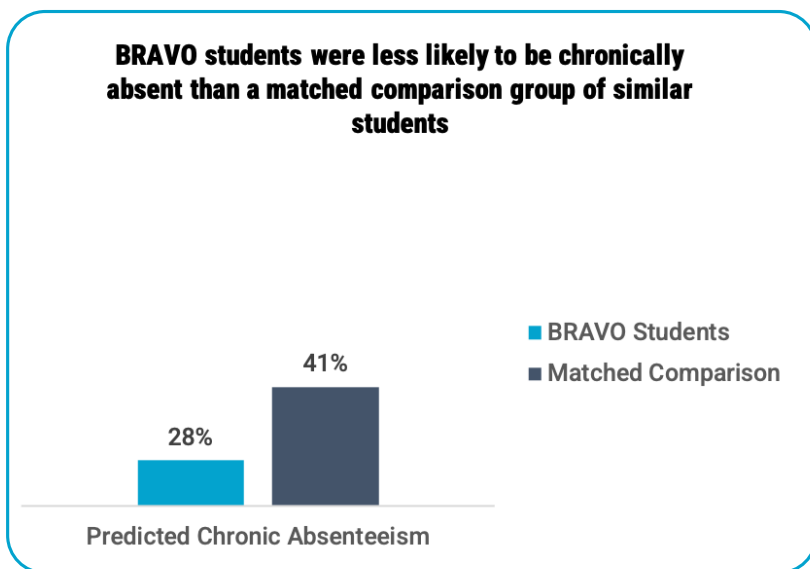
To examine this question, we compared attendance outcomes for BRAVO participants to a rigorously matched comparison group of similar students from the same schools. The matching process accounted for student demographic characteristics and prior academic achievement. By creating a comparison group with similar baseline characteristics, this approach reduces the likelihood that observed differences in attendance simply reflect pre-existing differences between students who participate in BRAVO and those who do not (see Appendix for methodological details).

Two key findings emerged from this analysis.



First, when examining **Average Daily Attendance (ADA)**—the percentage of school days attended over the course of the school year—BRAVO students attended school **3.6 percentage points more often** than matched peers.<sup>1</sup> As shown in the figure, BRAVO students had an ADA of **90.6 percent**, compared with **87.0 percent** for the comparison group.

Over a 180-day school year, this represents **approximately 6.5 additional days of school attendance** for the average BRAVO participant.



Second, we examined **chronic absenteeism**, defined as missing more than 10 percent of school days (equivalent to an ADA below 90 percent). Reducing chronic absenteeism has been a major focus of national, state, and district policy in recent years, particularly in response to increased absenteeism following the COVID-19 pandemic.

<sup>1</sup> This represents a moderate effect size (0.30 standard deviations). While the result approached statistical significance ( $p = .08$ ), the modest sample size limits statistical power.

As shown in the graph, the average comparison student falls below the chronic absenteeism threshold, while the average BRAVO student falls just above it. To examine this pattern more closely, we estimated a regression model predicting chronic absenteeism among the matched students while also controlling for grade level. The results indicate that **BRAVO participation was associated with a 13 percentage-point lower likelihood of chronic absenteeism** compared with matched peers.<sup>2</sup>

Because participation in BRAVO requires students to be present in school in order to attend afterschool programming, these findings suggest that the program may provide an additional motivation for students to attend regularly, resulting in more time spent in the classroom.

## Disciplinary Events

### Evaluation Question: Does participation in BRAVO lead to a decrease in disciplinary events?

To examine this question, we estimated a regression model predicting the number of suspensions among the matched sample, controlling for grade level.

The analysis found no statistically significant differences in suspensions between BRAVO participants and matched comparison students.

Suspensions were relatively infrequent in the matched sample, limiting statistical power to detect meaningful differences between groups. Suspension rates also varied significantly by grade, with higher rates observed in Grades 6 and 8 relative to other grades in the sample.

Taken together, these findings suggest that while BRAVO participation does not appear to be associated with measurable differences in suspensions in this dataset, the relatively small number of suspensions makes it difficult to draw conclusions about program impacts in this area.

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<sup>2</sup> Although this difference did not reach statistical significance ( $p=0.12$ ), the magnitude suggests an educationally meaningful reduction in chronic absenteeism associated with participation.

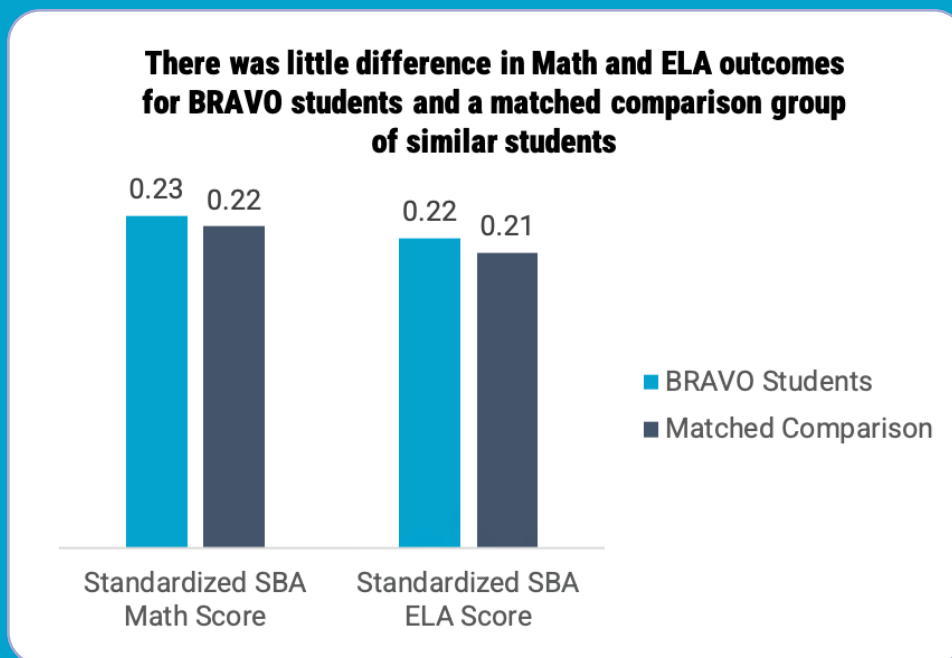
## Evaluation Question: Does participation in BRAVO help close achievement gaps in reading and mathematics performance?

Finally, we examined whether participation in BRAVO impacted participants' academic achievement. A body of research suggests that music education may support cognitive processes related to mathematics and literacy development.

To test this question, we used spring 2025 Smarter Balanced Assessment (SBA) scores in Mathematics and English Language Arts (ELA), Oregon's statewide standardized assessment. As in the attendance analysis, we compared BRAVO students to a matched comparison group of similar students from the same schools.

Because academic expectations increase from grade to grade, SBA scale scores were converted into grade-level standardized (z) scores. This approach evaluates each student's performance relative to peers in the same grade, allowing for fair comparisons between BRAVO and matched students.

After accounting for grade-level differences and using the matched comparison group, **BRAVO participation was not associated with statically measurable differences in SBA Math or ELA scores in this sample.**



Several factors may help explain this finding. Academic achievement reflects the cumulative influence of many experiences across students' school day and home environments, making it difficult for a single program to produce measurable changes in standardized test scores in the short term. In addition, BRAVO's primary focus is music education and youth development rather than direct academic instruction.

Overall, the findings suggest that BRAVO's most immediate impacts appear in **students' engagement with school and their sense of identity and belonging**, outcomes that may support longer-term academic success over time.



# CONCLUSIONS & STRATEGIC DIRECTIONS

The findings from this evaluation point to several encouraging signals about BRAVO's role in students' lives. Compared with similar peers, BRAVO students attended more school—equivalent to more than an additional week of instruction over the course of the year. Students also reported positive shifts in engagement and perseverance, and many expressed a strong sense of identity as musicians. Together, these findings suggest that BRAVO is supporting both student motivation and connection to school.

These results are particularly meaningful in the context of Oregon's ongoing challenge with chronic absenteeism. Programs like BRAVO that strengthen students' relationships, sense of belonging, and excitement about school may play an important role in helping students stay engaged in learning.

The five strategic recommendations below draw on both the evaluation findings and a collaborative sense-making session with BRAVO's leadership team. Rather than representing a fixed set of directives, they highlight strategic opportunities for strengthening the program as it continues to rebuild student cohorts and expand its impact.

## 1. Strengthen the Student Pipeline from Early Entry Through Middle School

**Strategic intent: Increase the number of students who enter BRAVO early and remain engaged across multiple years.**

BRAVO is in a period of growth, rebuilding its student cohorts and repositioning itself as an extracurricular activity within SUN Schools. While the data showed that most students were new to the program, supporting continued engagement – particularly participation across multiple years – is central to both student and program success.

An intentional pipeline strategy support recruitment, re-enrollment, and transition between program stages. Low retention and enrollment are strongly tied to transition points: entry into the program, re-enrollment each year, and the transition to middle school. Key ideas for addressing these challenges include:

- Strengthening the PreK to elementary/BRAVO entry pipeline
- Beginning recruitment and enrollment earlier in the school year

- Pre-registering returning students in spring or summer camp
- Using Grade 2 touchpoints to encourage enrollment in Grade 3
- Creating stronger supports for the Grade 5 to middle school transition
- Strengthening student and family buy-in with public performances

The underlying goal of these strategies is to **increase the proportion of students who enter early and stay multiple years**. Over time, this will result in more robust cohorts of students in middle and high school.

## 2. Expand Culturally Responsive Outreach to the Hispanic Community

**Strategic intent: Ensure BRAVO reflects and serves the full diversity of the Roosevelt cluster community.**

BRAVO has a lower proportion of Hispanic students compared to the overall school population. The team identified this as an important area for focused attention. Key ideas for deepening outreach and program accessibility for the Hispanic community include:

- Recruiting more bilingual Teaching Artists
- Strengthening Spanish-language communication and translation
- Providing family information sessions in Spanish
- Offering Spanish-language beginner classes
- Incorporating Hispanic Heritage Month programming, including performances
- Building stronger partnerships with community organizations, such as culturally-specific nonprofits

## 3. Invest in Teaching Artist Retention and Continuity

**Strategic intent: Sustain the trusted adult relationships that drive student engagement and attendance.**

Teaching Artists are the touchpoint for students in their engagement with the program; this relationship is deeply valued by students and teachers alike. These relationships take time to develop;

once established, they are a driver of student attendance, engagement, and retention. Stable Teaching Artists lead to stable relationships, which in turn support consistent student participation.

To strengthen Teaching Artist retention year-to-year, we recommend using Teaching Artist feedback to inform strategies. Focus groups with Teaching Artists conducted in February 2026 surfaced several concrete ideas for supporting their role. These included:

- Ensuring consistent teacher assignments when possible
- Exploring options for year-round income stability or expanded summer programming
- Providing clear scheduling tools and predictable work calendars
- Considering cost-of-living adjustments over time
- Prioritizing internal candidates for new or higher-level positions

A fuller analysis of feedback from Teaching Artists will be provided in an internal memo in Spring 2026 and incorporated into the 2025-26 evaluation report.

The underlying goal of these actions is to **recognize and protect one of BRAVO's core program assets: trusted adult relationships.**

#### 4. Intentionally Cultivate Students' Identity as Musicians

**Strategic intent: Strengthen students' sense of belonging, pride, and long-term connection to the program.**

BRAVO students identified strongly as musicians. Leaning more intentionally into the development of this identity can strengthen the sense of belonging and pride that sustains ongoing participation.

Ideas that surfaced include:

- Encouraging Teaching Artists and classroom teachers to explicitly name students as musicians
- Leveraging Student Ambassadors and peer mentorship
- Creating opportunities for older and younger students to perform together
- Highlighting student artistry in concerts and program events

## 5. Strengthen Program Data Systems to Support Continuous Improvement

**Strategic intent: Provide the information needed to understand student retention and guide program decisions.**

Several of the questions raised by the data—such as understanding when students leave the program or identifying key recruitment points—would benefit from stronger participation tracking systems. We therefore recommend enhancing systems for tracking student participation and retention, and are available to provide guidance in these efforts.

Priority elements could include: student start dates and exit dates, drop reasons, years in program, and cohort tracking across years. The system could be either (a) an enhanced version of the current spreadsheet structure and data procedures, or (b) a simple relational database. Either approach would allow BRAVO to monitor retention trends more easily, identify transition points where students leave, evaluate the success of recruitment strategies, and strengthen grant reporting and evaluation capacity.

### In Summary

Taken together, these recommendations emphasize strengthening the systems that support long-term student participation: early recruitment pipelines, culturally responsive outreach, stable and supported teaching artists, opportunities for students to develop their identity as musicians, and stronger data systems to guide continuous improvement. As BRAVO continues rebuilding its cohorts and expanding its reach, these strategies can help ensure that more students enter the program earlier, remain engaged for multiple years, and experience the full benefits of sustained participation. Future evaluation work will continue to examine these areas and incorporate additional perspectives—including deeper analysis of Teaching Artist feedback—to support BRAVO’s ongoing growth.

# APPENDIX: METHODOLOGY

This evaluation utilized quantitative data from two primary sources: (1) a student survey administered as part of the El Sistema USA (ESUSA) national evaluation, and (2) administrative student data from Portland Public Schools.

## Surveys

### Design and Administration

The student surveys were designed by Dr. Deborah Ward for El Sistema USA (ESUSA) to track collective impact and student outcomes across *El Sistema* programs. They are focused on social-emotional indicators and also provide programmatic feedback. Individual programs upload their survey data to an online dashboard which allows them to view their results and customize analyses. Surveys are administered twice a year: once in the fall (pre) and once in the spring (post). BRAVO students completed the surveys online during an after-school regularly scheduled session, supervised by their Teaching Artist. The 2024-25 school year was the first in which BRAVO administered the student survey. There were 73 pre surveys and 57 post surveys.

### Analysis

Data were downloaded from the dashboard in aggregated, group-level form. Individual items are presented in this evaluation as reported by the dashboard.

In addition, we collapsed several items into **social-emotional indices**. The ESUSA survey includes multiple items aligned with common dimensions of social-emotional development, including Confidence, Engagement and Agency, Perseverance, Empathy, Well-Being, and Arts Identity. Items were grouped into domains based on established theoretical frameworks in the social-emotional learning, student engagement, and arts identity literature.

Because student-level data were not available, indices were constructed using aggregated item-level means at each time point (pre and post). For each domain:

- Items were first reviewed to ensure consistent directional coding.
- Negatively worded items were reverse coded by multiplying values by  $-1$  (the survey scale ranged from  $-3$  to  $+3$ ).
- Domain indices were calculated by averaging the mean values of all items within the domain.

Each index therefore reflects the average level of agreement across conceptually related items and is reported on the original  $-3$  to  $+3$  scale.

These indices represent group-level composite indicators rather than individual-level psychometric scales. Because student-level response data were unavailable, internal consistency reliability (e.g., Cronbach's alpha) and statistical significance testing of change could not be calculated. Accordingly, results are interpreted descriptively and reflect group-level trends over time rather than individual student growth.

Pre–post differences were calculated by subtracting the fall index mean from the spring index mean. Percent change was calculated relative to the total possible range of the scale, allowing change to be interpreted as a proportion of the maximum possible movement on the index. Changes are reported descriptively and should be interpreted as directional patterns rather than causal effects.

## Portland Public Schools Data

Portland Public Schools provided the evaluation with a de-identified student-level dataset, in which BRAVO participants were flagged based on records maintained by the program. Comparisons of BRAVO students and all non-BRAVO students were conducted using simple descriptive statistics and frequencies.

## Propensity Score Matching

To analyze student outcomes associated with participation in BRAVO, we generated a **matched comparison group** using propensity score matching (PSM). Propensity score matching is a quasi-experimental method that reduces selection bias in non-randomized studies by creating a comparison group of students who are statistically similar to program participants on key baseline characteristics.

Because students are not randomly assigned to participate in BRAVO, simple comparisons between participants and non-participants can reflect underlying differences rather than program effects. PSM addresses this challenge by estimating each student’s probability of participating in BRAVO (their “propensity score”) based on observed characteristics. Students in the comparison group are then matched to BRAVO participants with similar propensity scores. This approach strengthens the rigor of the analysis by improving baseline equivalence between groups (the degree to which groups resemble each other in immutable and pre-program ways) and increasing confidence that observed outcome differences are associated with program participation rather than pre-existing differences.

We implemented 2:1 nearest neighbor matching with a caliper of 0.20 of the standard deviation of the logit probability score, a commonly recommended threshold for reducing poor matches. This means that for each BRAVO participant, up to two non-participating students with the closest propensity scores were selected, provided their scores fell within the specified caliper threshold. The caliper restricts matches to students whose likelihood of participation is sufficiently similar, reducing poor-quality matches and improving internal validity.

Students were drawn from the same schools as BRAVO participants and then matched on the following baseline characteristics:

- Gender
- Current English Learner (EL) status
- Special education eligibility
- Student of color status
- Prior academic achievement (English Language Arts standardized score from the prior year)

Including prior academic achievement is a particularly important strength of the model, as prior performance is one of the strongest predictors of future outcomes. By matching on prior ELA performance, the analysis accounts for pre-existing academic differences between students.

However, this decision reduced the analytic sample size. Only students with available Spring 2024 Smarter Balanced Assessment (SBA) results could be included in the matching process. As a result, the final matched analytic sample included 46 BRAVO students and 92 matched comparison students. While this smaller sample size limits statistical power, it increases the rigor and credibility of the findings by ensuring stronger baseline comparability between groups.

The table below presents baseline characteristics of BRAVO participants and the matched comparison group after propensity score matching. Groups are closely aligned across demographic characteristics and prior academic achievement, indicating improved balance following the matching procedure.

Race/ethnicity was included in the matching model using a binary indicator (Students of Color vs. White). Preliminary models using a more detailed six-category race/ethnicity variable did not yield stable matches due to small cell sizes within several subgroups. To preserve model stability and maintain an adequate analytic sample, the more aggregated race/ethnicity indicator was used for matching. Disaggregated race/ethnicity percentages are displayed below for descriptive transparency.

	Matched Comparison (n=92)	BRAVO (n=46)
Female	60%	61%
Male	38%	37%
Non-Binary	2%	2%
Current EL	2%	4%
Special Education (inside regular classroom >80% of time)	10%	7%
SBA ELA z-score	.206	.215
Students of Color	53%	54%
Asian	1%	2%
Black	14%	20%
Hispanic	26%	15%
Multiple	12%	13%
Pacific Islander	0%	4%
White	47%	46%

## Outcome Analysis

Following matching, regression analyses were conducted to estimate differences in outcomes between BRAVO participants and matched comparison students. Regression modeling allows us to adjust for any other remaining covariate differences after matching, and to isolate the association between BRAVO participation and the outcome.

For attendance and discipline, grade level has an influence on expectations and norms. We therefore included grade level as a covariate in the regression models. For academic achievement analyses, we accounted for grade-level differences by converting Smarter Balanced Assessment (SBA) raw scale scores into grade-level standardized scores (z-scores). Standardizing scores within grade levels allows student performance to be interpreted relative to same-grade peers. This ensures that comparisons between BRAVO and matched students do not reflect differences in grade-level test difficulty.

Together, the use of propensity score matching, grade-adjusted regression modeling, and grade-level standardized achievement scores strengthens the methodological rigor of this evaluation and increases confidence that observed differences are associated with BRAVO participation rather than pre-existing academic or demographic characteristics.

### Limitations

This evaluation has several important limitations that should be considered when interpreting findings.

First, the analytic sample for the matched comparison outcome analyses was restricted to 46 BRAVO students due to the inclusion of prior academic achievement in the propensity score model. While this strengthened group comparability, it reduced statistical power and may have limited the ability to detect small but meaningful effects.

Second, although propensity score matching improves equivalence between groups on observed characteristics, it cannot account for unmeasured factors such as student motivation, family engagement, transportation access, scheduling constraints, or prior interest in music that may influence both program participation and outcomes. As a result, findings should be interpreted as rigorous quasi-experimental estimates rather than causal proof.

Third, survey analyses were conducted using aggregated (item-level) summary data rather than student-level responses. The evaluation team did not have access to individual survey records, which limited the ability to conduct subgroup analyses or assess statistical significance.

Fourth, the evaluation did not include data on years of participation or dosage (e.g., frequency of attendance, intensity of instruction, or cumulative years in the program). As a result, analyses could not examine whether longer or more intensive participation was associated with stronger outcomes.

Finally, findings are based on data from a single school year. As such, results should be interpreted as rigorous estimates within the available data, with future years of data strengthening findings and generalizability.

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