Summer Arts & Learning Academy: Results for 2018
Guiding Questions for the Analyses

- Was participation in SALA associated with change in:
  - Scores on SALA math, reading comprehension, or writing assessments?
  - DIBELS tests administered during SALA?
  - Socioemotional development, as rated by:
    - Parents?
    - Students?

- Is the degree of change contingent upon:
  - Student’s grade in school?
  - ESY classification?
  - Current (2018) or prior attendance at SALA?
  - Relative placement of benchmark status?
Basic Information About the Sample
Total Sample Size \((N = 2119)\)
Distribution by: Gender, Race, Grade, & Language

<table>
<thead>
<tr>
<th>Gender</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1016</td>
<td>47.9</td>
</tr>
<tr>
<td>Male</td>
<td>1103</td>
<td>51.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian</td>
<td>5</td>
<td>0.2</td>
</tr>
<tr>
<td>Asian</td>
<td>11</td>
<td>0.5</td>
</tr>
<tr>
<td>Black/African American</td>
<td>1957</td>
<td>92.4</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>7</td>
<td>0.3</td>
</tr>
<tr>
<td>White</td>
<td>134</td>
<td>6.3</td>
</tr>
<tr>
<td>Multiple</td>
<td>5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic/Latinx</td>
<td>190</td>
<td>9.0</td>
</tr>
<tr>
<td>Not Hispanic/Latinx</td>
<td>1929</td>
<td>91.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K</td>
<td>162</td>
<td>7.6</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>369</td>
<td>17.4</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; grade</td>
<td>402</td>
<td>19.0</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; grade</td>
<td>338</td>
<td>16.0</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; grade</td>
<td>335</td>
<td>15.8</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>280</td>
<td>13.2</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; grade</td>
<td>233</td>
<td>11.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>1853</td>
<td>87.4</td>
</tr>
<tr>
<td>Spanish</td>
<td>117</td>
<td>5.5</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>0.7</td>
</tr>
<tr>
<td>Missing</td>
<td>134</td>
<td>6.3</td>
</tr>
</tbody>
</table>
### Distribution by: ELL, IEP, ESY & Prior Attendance

<table>
<thead>
<tr>
<th>Classification</th>
<th>$n$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELL Classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1977</td>
<td>93.3</td>
</tr>
<tr>
<td>Yes</td>
<td>142</td>
<td>6.7</td>
</tr>
<tr>
<td>IEP Classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1720</td>
<td>81.2</td>
</tr>
<tr>
<td>Yes</td>
<td>399</td>
<td>18.8</td>
</tr>
<tr>
<td>ESY Classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1994</td>
<td>94.1</td>
</tr>
<tr>
<td>Yes</td>
<td>125</td>
<td>5.9</td>
</tr>
<tr>
<td>Reading Partners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2020</td>
<td>95.3</td>
</tr>
<tr>
<td>Yes</td>
<td>99</td>
<td>4.7</td>
</tr>
<tr>
<td>Prior Attendance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1761</td>
<td>83.1</td>
</tr>
<tr>
<td>One year</td>
<td>296</td>
<td>14.0</td>
</tr>
<tr>
<td>Two years</td>
<td>62</td>
<td>2.9</td>
</tr>
</tbody>
</table>

- **Prior attendance**
  - $M = 72.9\%$
  - $SE = 0.6\%$
  - Range $= [4 – 100\%]$
Math, Reading Comprehension, and Writing Assessments: Was There an Effect of SALA on Scores?
Analytic Approach: Multilevel Models

For a given outcome, with points of measurement $i$ (before SALA) and $j$ (after SALA) for each student, what is the effect of $time$, after accounting for all relevant covariates (gender, race, SALA classroom, etc….) and measurement error?

\[
outcome_{ij} = intercept + time_{ij} + gender_{ij} + \ldots + error_{ij}
\]

If the coefficient for $time$ is statistically significant and positive, it means the given outcome increased over the course of SALA. We can then obtain model-implied or adjusted estimates of the before- and after-SALA values of the outcome that account for covariates.
Crucial Point About the Analyses

In this presentation we often use the phrases:
• The “effect of SALA,” or
• The “effect of time.”

This is a convenient shorthand. In point of fact, without a randomly-assigned control group we cannot definitively establish that SALA caused the effects we observed.

Rather, we can say that participation in SALA co-occurred with the changes in different measures we observed.
Math Scores

Before SALA: 0.36
After SALA: 0.52

$d = 0.59$, $p = 0.002$

$\text{Model-implied estimates}$
$\text{Standard error of the estimate}$

$\text{d} =$ effect size
$\text{p} =$ statistical significance

Math Assessment (N=1195)
Reading Comprehension Scores

Before SALA After SALA
37.9% 49.7%  

Effect Size 1.18

$\text{d} = 0.44, p < 0.001$
Writing Scores

Before SALA After SALA Before After Diff SD d
Content (N=507) 1.58 2.24 SE 0.18 0.18 Effect Size 0.66 0.89
Structure (N=507) 1.57 2.14 Effect Size 0.65 0.89

$d=.74, p < .001$
$d=.65, p < .001$
Was There an Effect of SALA on...

• Math Scores?
  • Yes.
  • The effect size was approximately twice the DoE threshold.

• Reading Comprehension Scores?
  • Yes.
  • The effect size was again twice the DoE threshold.

• Writing Scores?
  • Yes, for both structure and content.
  • The effect size ranged from over twice to three times the DoE threshold.
Math, Reading Comprehension, and Writing Assessments: Does SALA Effect Vary by Grade, ESY, Current or Prior Attendance, Relative Placement, or Teacher Experience?
**Math Scores:** Differences in Effect Size by Grade

Effect sizes were similar for students from pre-K to 3rd grade. However, in 4th and particularly 5th grade, effect sizes were smaller.

(Detailed graph showing percent of items correct before and after SALA, with lines indicating grade-specific effect sizes.)
**Writing Structure Scores: Differences in Effect Sizes by Grade**

The opposite phenomenon was observed for writing structure scores. Older students exhibited larger effect sizes.
Math Scores: Differences in Effect Size by End of Year Grade Level (iReady)

Students at grade level realized a substantial increase in math scores. But those below grade level – whether 1 grade below or more – realized an increase approximately 1.5 times that realized by their peers.
Math Scores: Differences in Effect Size by Teacher Experience

Students with returning SALA math teachers exhibited larger gains in math scores.
Among students with returning literacy teachers parallel results were observed for writing structure scores…
Writing Content Scores: Differences in Effect Size by Teacher Experience

... and writing content scores.
Does SALA Effect Vary By…

• Grade?
  • Yes, for math and writing structure score.
  • Effects were largest for younger students for math and for older students for writing structure.

• ESY Status? No.

• Reading Partners (RP) Participation?
  • Yes. Effects were largest for students in reading partners.

• Current or Prior Attendance? No.

• End of Year Grade Level?
  • Yes, for math.
  • Effects were largest for students below grade level.

• Teacher Experience?
  • Yes, effects for math and writing were largest for students with returning teachers.
DIBELS: Was There an Effect of SALA on Scores?
DIBELS: Phoneme Segmentation and Nonsense Words

- Phoneme Segmentation (N=85):
  - Before SALA: 31.60
  - After SALA: 44.10
  - $d = 0.79, p < 0.001$

- Nonsense CLS (N=207):
  - Before SALA: 46.76
  - After SALA: 53.40
  - $d = 0.23, p < 0.001$

- Nonsense WWR (N=207):
  - Before SALA: 13.68
  - After SALA: 14.83
  - $d = 0.10, p = 0.004$
**DIBELS: DORF**

- **Retell**
  - Before SALA: 15.32
  - After SALA: 19.37
  - **d=.17, p =.002**

- **Fluency**
  - Before SALA: 16.88
  - After SALA: 21.01
  - **d=.11, p < .001**

- **Accuracy**
  - Before SALA: 71.28
  - After SALA: 74.99
  - **d=.15, p < .001**
Was There an Effect of SALA on DIBELS Scores?

• Yes. However,
  • While all effects were statistically significant ($p < .05$)…
  • Not all effects were practically important ($d > .25$).

• Effects were practically import for:
  • Phoneme segmentation.
  • They were nearly practically important for Nonsense CLS.

• Effects were not practically important for:
  • Nonsense WWR and the DORF subscales.
DIBELS: 
Does SALA Effect Vary by Grade, ESY, Current or Prior Attendance, Benchmark Status, or Teacher Experience?
DIBELS: Nonsense CLS by Prior Attendance

![Bar chart showing scores before and after SALA for different levels of prior attendance.](chart.png)

- **None**: Before SALA: 46.96, After SALA: 52.36, $d = 0.19$
- **1 year**: Before SALA: 44.55, After SALA: 59.07, $d = 0.51$
- **2 years**: Before SALA: 40.44, After SALA: 48.09, $d = 0.27$
DIBELS: DORF Fluency by Prior Attendance

Before SALA  After SALA Before  After  Diff  SD  d
None (N=141)  17.16  19.84  d=.07
1 year (N=45)  22.10  29.90  d=.21
2 years (N=5)  27.95  38.81  d=.30

Score

0.00  10.00  20.00  30.00  40.00  50.00  60.00  70.00

None (N=141)  17.16  19.84
1 year (N=45)  22.10  29.90
2 years (N=5)  27.95  38.81

Before SALA  After SALA
Does SALA Effect Vary By…

• Grade? No.

• ESY Status? No.

• Current or Prior Attendance?
  • Yes, for Nonsense CLS and DORF Fluency.
  • For both measures, effects were practically important (or nearly so) for students who had attended SALA in the past.

• Benchmark Status? No.

• Teacher experience? No.
Cooperation, Empathy, or Self-Control: Was There an Effect of SALA on Scores?
Parent-Reported Empathy

Before SALA: 2.48
After SALA: 2.55

Effect Size: 0.15

Score (Range = 0 to 4)

Empathy (N=449)

\[ d = 0.28, \ p = 0.011 \]
Parent-Reported Self Control: Differences in Effect Sizes by Prior Attendance

- None (N=378): d=-.01
  - Before SALA: 1.89
  - After SALA: 1.90
- 1 year (N=56): d=.25
  - Before SALA: 1.95
  - After SALA: 2.12
- 2 years (N=16): d=.52
  - Before SALA: 1.78
  - After SALA: 2.13
Was There an Effect of SALA on SEL Scores?

• Yes. An effect was observed for parent-reported empathy.

• However, effects were not observed for:
  • Parent-reported cooperation or self-control.
  • Student-reported SEL scores of any kind.
  • In fact, students exhibited significant decreases in scores.

Did SALA Effects Vary by…

• Grade? No. ESY? No.

• Current or Prior Attendance?
  • Yes. Students who attended in prior years had higher parent-reported self-control.
Teacher-Reported Cooperation, Empathy, & Self-Control

Teachers only completed measures after SALA, and were asked how high levels of cooperation, empathy, and self-control were relative to the beginning of the program. A 2 = “About the same,” while a 3 = “A little more.”

- **Cooperation** (N=920): 2.57
- **Empathy** (N=922): 2.60
- **Self-Control** (N=922): 2.50
Unexpected Findings: Differences in SALA Effects by IEP Status
Writing Content Scores: Differences in Effect Sizes by IEP Status

![Graph showing differences in writing content scores by IEP status before and after SALA.](image)
Parent-Reported Self Control: Differences in Effect Sizes by IEP Status

No IEP (N=377)

Before SALA: 1.94
After SALA: 1.96
Effect Size: 0.03

IEP (N=73)

Before SALA: 1.62
After SALA: 1.74
Effect Size: 0.18
Student-Reported Empathy: Differences in Effect Sizes by IEP

No IEP (N=355)

- Before SALA: 2.11
- After SALA: 2.02
- Effect Size: d = -0.13

IEP (N=86)

- Before SALA: 2.03
- After SALA: 2.13
- Effect Size: d = 0.14

Before SALA After SALA Diff SD d
Unexpected Findings

• The increase in writing content scores were higher among students with an IEP classification than their peers.

• Increases in parent-reported SEL:
  • Approached the threshold for practical importance for cooperation for students with an IEP classification.
  • Exceeded the threshold for practical importance for self-control for students with an IEP classification.

• Students with an IEP classification reported increases in self-reported empathy.
Next Steps

• Add missing data

• Add classifications for:
  • New teachers
  • New sites
  • Reading Partners classification

• Re-run analyses and update

• Discuss procedures for 2019 evaluation:
  • Data collection: Retaining student and parent SEL measures?
  • Data management: Building a database for SALA?