The BARR Program:
Impacting Social Emotional Skills and Academic Achievement of 9th grade students in 6 High Schools

Background
Building Assets Reducing Risks (BARR)

• The BARR model builds positive, intentional, relationships among and between students and teachers.

• Ninth grade is restructured into teacher teams of shared students composed of three or four core academic teachers as well as one or more school counselors.

• BARR teachers use real-time student data to drive instructional change and identify nonacademic supports when needed.
Prior Research on BARR

• In 2011–12, a randomized controlled trial (RCT) in one large urban school district yielded positive impacts on students and teachers

• Compared with students not assigned to BARR:
  – BARR students earned more credits.
  – BARR students scored higher on both reading and mathematics standardized tests.
  – BARR students had fewer course failures than those not assigned to BARR.
  – BARR teachers felt more connected to students, other teachers, and their schools, and they reported higher levels of teacher effectiveness than those not implementing BARR.

Study Overview

• Student level randomized controlled trial
• Three cohorts of students
• Eleven schools total
• Participants in this study
  – All eligible ninth-grade students
  – Core academic teachers
  – School counselors, administrators, BARR coordinator
• Study includes measures of
  – Implementation
  – Student academic outcomes
  – Student and teacher perceptions
Research Questions

• What is the impact of BARR on ninth-grade students’ academic achievement as measured by NWEA reading and mathematics tests?
• What is the impact of BARR on ninth-grade students’ educational attainment as measured by the percentage of credits earned in core subjects?
• To what extent do students’ self-ratings of proximal measures of student achievement (e.g., engagement, sense of belonging, and grit) differ between BARR and non-BARR students?
• To what extent do ratings of proximal measures of student achievement (e.g., teacher self-efficacy and use of data) differ between BARR and non-BARR teachers?
Data Sources

• Administrative student demographic records
• Administrative student academic, attendance, and discipline records
• NWEA MAP reading and mathematics scores
• Survey administered to students in Grade 9
• Survey administered to core subject teachers of Grade 9 students

• Other data sources
  – Interview data from core subject teachers
  – Interview data from BARR coordinators
  – Observation data from spring site visits to each school
Results: Cohorts 1 and 2 (2014–15 and 2015–16)
Sample

- Six schools
  - California (3); Maine (2); Minnesota (1)
- 2,172 students
  - BARR students = 981
  - Control students = 1,191
- Student sample:
  - 71% minority students
  - 70% Free or Reduced-Price Lunch
  - 21% English Language Learners
  - 8% Special Education Status
Student Outcomes

- NWEA MAP Reading scores
- NWEA MAP Mathematics scores
- Core credits earned
- Passing all core courses
- Student survey measures
  - Expectations and rigor
  - Engagement
  - Supportive relationships
  - Social and emotional learning
  - Sense of belonging
  - Grit
## Student Outcomes—Survey

<table>
<thead>
<tr>
<th>Construct</th>
<th>Scale Scores</th>
<th>Diff</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BARR</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Expectations and rigor</td>
<td>51.2</td>
<td>48.9</td>
<td>2.3***</td>
</tr>
<tr>
<td>Student engagement</td>
<td>50.6</td>
<td>49.4</td>
<td>1.2*</td>
</tr>
<tr>
<td>Supportive relationships</td>
<td>51.8</td>
<td>48.4</td>
<td>3.4***</td>
</tr>
<tr>
<td>Social and emotional learning</td>
<td>50.0</td>
<td>50.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sense of belonging</td>
<td>50.2</td>
<td>49.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Grit</td>
<td>49.8</td>
<td>50.2</td>
<td>−0.4</td>
</tr>
<tr>
<td><strong>Sample size</strong></td>
<td><strong>730</strong></td>
<td><strong>801</strong></td>
<td></td>
</tr>
</tbody>
</table>
Student Outcomes—NWEA Assessments

**Measures of Academic Progress (MAP) scores**

- There was a positive and statistically significant difference in the end-of-year MAP scores for BARR students compared to control students in both Reading and Math.

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>BARR</th>
<th>Control</th>
<th>Diff</th>
<th>$p$ Value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading MAP Score</td>
<td>222.8</td>
<td>221.7</td>
<td>1.1</td>
<td>$\leq .05$</td>
<td>0.08</td>
</tr>
<tr>
<td>Math MAP Score</td>
<td>231.2</td>
<td>229.7</td>
<td>1.5</td>
<td>$\leq .01$</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Sample size

- BARR: 740
- Control: 891
### Student Outcomes—Core Credits

<table>
<thead>
<tr>
<th>Outcome Measures (%)</th>
<th>BARR</th>
<th>Control</th>
<th>Diff</th>
<th>( p ) Value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total credits earned</td>
<td>84.3</td>
<td>79.0</td>
<td>5.3</td>
<td>( \leq .001 )</td>
<td>0.05</td>
</tr>
<tr>
<td>--ELA credits earned</td>
<td>87.4</td>
<td>76.9</td>
<td>10.5</td>
<td>( \leq .001 )</td>
<td>0.11</td>
</tr>
<tr>
<td>--Science credits earned</td>
<td>85.3</td>
<td>77.1</td>
<td>8.2</td>
<td>( \leq .001 )</td>
<td>0.08</td>
</tr>
<tr>
<td>--Math credits earned</td>
<td>79.1</td>
<td>81.3</td>
<td>-2.2</td>
<td>n.s.</td>
<td>-0.02</td>
</tr>
<tr>
<td>--Social Studies credits earned</td>
<td>98.2</td>
<td>97.8</td>
<td>0.4</td>
<td>n.s.</td>
<td>0.00</td>
</tr>
<tr>
<td>Passing all core courses</td>
<td>70.3</td>
<td>57.7</td>
<td>12.6</td>
<td>( \leq .001 )</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Sample size</strong></td>
<td>824</td>
<td>1,004</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: n.s. = not statistically significant, \( p > .05 \).*
Mediation Analysis
Exploration of Mediation Analysis

• **Mediators**
  – Six student survey scale scores (representing student experiences)
  – Student attendance rate (%) during the year
  – Total suspensions a student received during the year

• **Academic achievement outcomes**
  – NWEA scale scores (Reading and Math)
  – Core credits earned

• **Additional variables in the model**
  – Pretest NWEA scores
  – Student background characteristics
BARR MEDIATION MODEL

BARR

- Expectation & Rigor
- Engagement
- Supportive Relationship
- Social & Emotional Learning
- Sense of Belonging
- Grit

Pretest

Attendance Rate

Suspension

Outcome

Student Background Characteristics
BARR IMPACT ON READING ACHIEVEMENT

- **BARR**
  - Expectation & Rigor
    - Engagement
      - Supportive Relationship
  - Attendance Rate
  - Suspension
- **Reading Achievement**

Path coefficients:
- **BARR** → **Expectation & Rigor**: 0.13***
- **BARR** → **Engagement**: 0.07**
- **BARR** → **Supportive Relationship**: 0.18***
- **Expectation & Rigor** → **Engagement**: 0.10*
- **Engagement** → **Supportive Relationship**: 0.12***
- **Engagement** → **Reading Achievement**: 0.06**
- **Suspension** → **Supportive Relationship**: 0.07**
- **Attendance Rate** → **Reading Achievement**: 0.04*
BARR IMPACT ON MATH ACHIEVEMENT

BARR

Expectation & Rigor

Engagement

Supportive Relationship

Attendance Rate

Suspension

Math Achievement

0.13**

0.07**

* 0.18**

-0.10*

0.13**

0.12**

0.13**

0.05**

0.04**

0.03*
BARR IMPACT ON COURSE CREDIT OUTCOME

Graph showing the relationship between BARR, Expectation & Rigor, Engagement, Supportive Relationship, Attendance Rate, Suspension, and Course Credit Outcome.
Caveats

• These are formative findings from an ongoing three-cohort study

• Teachers were not randomly assigned to BARR: The effects of the program cannot be disentangled from those resulting from systematic differences in teacher effectiveness.
Conclusions

• Prior research shows that BARR has a positive impact on student achievement in the 9th grade
• This study replicates those findings with two additional cohorts of 9th grade students
• Further, this study demonstrates that increases in academic achievement are mediated through improvements in student engagement and expectation, stronger and more supportive relationships, better attendance rates, and lower suspension rates.
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