Title: The BARR Model Impacting 9th grade Educational Outcomes: Final Results from a Three-Year Randomized Controlled Trial

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Final Results from a Three-Year Randomized Controlled Trial

Background

American high schools are not meeting the needs of today’s students. Nearly 500,000 young people leave high school before graduating each year, severely limiting their options for further education and sustainable employment (Center for Promise, 2015). Those not receiving a high school diploma will remain less likely to be employed, will earn lower incomes, are more likely to require social services, are more likely to be involved with the justice system, and live shorter, less healthy lives (Caterall, 2011; Civic Enterprises, 2015; Rouse, 2007; Sum et al, 2009). According to America’s Promise (2016), if the graduation rate increased to 90 percent for just one cohort of students, the country would see a $7.2 billion increase in annual earnings and a $1.1 billion increase in federal tax revenue.

While students can drop out at any point before graduation, 9th grade is a critical year. Research shows that 9th grade dropout rates and failure rates are higher than they are in any other grade (McCallumore & Sparapani, 2010; Smith, 2006). Students on track at the end of their freshman year, based on course performance and credit accumulation, are more likely to graduate from high school within four years than their off-track peers (Allensworth & Easton, 2007).

Addressing the importance of students remaining on track during the transition to high school, one intervention, the Building Assets Reducing Risks (BARR) model, combines the use of real-time student data, research-based relationship-building strategies, and intensive teacher collaboration to prevent course failure. It is built on educational research that positive school climate, school connectedness, learning engagement, and positive relationships between students and staff—and among staff—are essential ingredients for turning around low performing schools. (Gordon & Crabtree, 2006; National Research Council, 2004; Cohen, 2006; Jerald, 2006; De La Ossa, 2005).

Instantiation of the BARR model within a growing number of schools mirrors one of the fundamental principles of the program: relationship building. A direct result of strong relationships with researchers and local education agencies, BARR has grown from one school in St. Louis Park, Minnesota to 80 schools in 14 states. The first study, funded by the Minnesota DOE, yielded evidence of promise for struggling 9th grade students, which led to funding from the Department of Education of three separate investing in innovation (i3) grants (Development, Validation, and Scale-up). Alongside the partnership between BARR developers and teams of researchers are consistent and growing partnerships between BARR developers and school districts. Leveraging these important research-to-practice partnerships, the BARR development team is seeking to demonstrate not only that the BARR model works, but how, for whom, and under what conditions, it is most effective.

Research Design

The study design is a within-school, student-level RCT, involving 9th grade students, their core academic teachers, and their school counselors. It was carried out during three academic years (2014-15, 2015-16, 2016-17), with three distinct cohorts of schools. Each of the cohorts was statistically well-powered allowing for the second and third cohort study
findings to serve as within study replications with the specific aim of generalizing results beyond the initial sites (Schmidt, 2009). The student data, collected from a total of 11 schools support investigation of both treatment effect heterogeneity across sites, and among subpopulations of students (Imai & Ratkovic, 2013).

**Intervention**

The BARR model restructures the ninth grade into blocks of three-person teacher teams working with shared groups of students. Teams engage in collaborative assessment, problem solving and planning on a weekly basis. The model includes on site coaching, quarterly site-to-site mentoring visits and technology enabled learning opportunities.

**Sample/Setting**

This study randomly assigned approximately 4,200 9th grade students to experimental conditions (treatment and control) and included approximately 113 teachers (half receiving BARR training, and half not receiving training) across 11 schools, located in California, Maine, Minnesota, Kentucky, and Texas. The student sample is comprised of approximately 75% minority students, nearly 80% are economically disadvantaged, and approximately 30% are classified as English learners.

**Data Collection and Analysis**

Data collected included:

- Student demographics (e.g., race/ethnicity, gender, free or reduced price lunch status),
- Student surveys measuring six constructs (i.e., expectations and rigor; student engagement; supportive relationships; socio-emotional learning; sense of belonging; and grit),
- Student performance data: standardized tests scores (NWEA MAP reading and mathematics scores); grades and credit data for core academic courses,
- Student behavioral data: attendance records, discipline referrals.

Programmatic effects were estimated using a series of multilevel models that treat students as nested within schools. Inclusion of a level-2 random effect for the treatment slope allowed for an estimation of variation in treatment effects across schools, and by including interaction terms (e.g., race/ethnicity and a treatment indicator) we estimated differences in impacts among subgroups of students. Models included student demographic data and controlled for starting skill level, or prior measures of behavior.

**Findings/Results**

Analysis of baseline data demonstrate that random assignment yielded experimental groups that were functionally equivalent on pretest measures and most demographic variables. Calculation of overall and differential attrition rates for standardized outcomes measures indicated that this study would meet What Works Clearinghouse Standards (http://ies.ed.gov/ncee/wwc/default.aspx) without reservations.

Preliminary analyses of outcome data (from cohort 1 and cohort 2) suggest that BARR had a positive and statistically significant impact on student’s reading and mathematics scores (ES=.08; p ≤.05) and that students assigned to receive BARR supports earn more credits than students assigned to the control condition (ES=.05, p≤.001) (see Table 1.) Analyses of outcome
data from cohort 3 are underway and will be presented as well. Variation in impacts across
cohorts, subgroups, and schools will be analyzed to establish whether and how the impact of
BARR varies across these dimensions.

Analysis of student survey data from all cohorts suggest that BARR has a positive and
statistically significant impact on three measures of student experience: expectations and rigor
(ES=.25, p≤.001), student engagement (ES=.11, p≤.05), and supportive relationships (ES=.29,
p≤.001) (see table 2).
Appendix A: References


Appendix B: Analytic Results

Table 1. Analytic Results of Academic Outcome Measures

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>BARR</th>
<th>Control</th>
<th>Diff</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading NWEA</td>
<td>222.81</td>
<td>221.69</td>
<td>1.13</td>
<td>0.08*</td>
</tr>
<tr>
<td>Mathematics NWEA</td>
<td>231.21</td>
<td>229.74</td>
<td>1.47</td>
<td>0.08**</td>
</tr>
<tr>
<td>Core Credits Earned</td>
<td>84.3%</td>
<td>79.0%</td>
<td>5.3%</td>
<td>0.05***</td>
</tr>
</tbody>
</table>

*Notes: statistically significant * = p ≤ .05 level, ** = p ≤ .01 level, *** = p ≤ .001 level.

Table 2. Impacts on Student Experiences from Student Survey (Cohorts 1, 2 and 3)

<table>
<thead>
<tr>
<th>Student-Reported Outcome</th>
<th>N</th>
<th>BARR</th>
<th>Control</th>
<th>Difference</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectations and rigor</td>
<td>2,743</td>
<td>51.3</td>
<td>48.9</td>
<td>2.5***</td>
<td>0.25</td>
</tr>
<tr>
<td>Student engagement</td>
<td>2,719</td>
<td>50.6</td>
<td>49.5</td>
<td>1.1*</td>
<td>0.11</td>
</tr>
<tr>
<td>Supportive relationships</td>
<td>2,714</td>
<td>51.6</td>
<td>48.7</td>
<td>2.9***</td>
<td>0.29</td>
</tr>
<tr>
<td>Social and emotional learning</td>
<td>2,698</td>
<td>50.1</td>
<td>49.9</td>
<td>0.2</td>
<td>0.02</td>
</tr>
<tr>
<td>Sense of belonging</td>
<td>2,690</td>
<td>50.2</td>
<td>49.8</td>
<td>0.5</td>
<td>0.05</td>
</tr>
<tr>
<td>Grit</td>
<td>2,683</td>
<td>50.0</td>
<td>50.0</td>
<td>0.0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Notes: * = statistically significant at the p < .05 level; *** = statistically significant at the p < .001 level.