Starting Strong:

A Randomized Controlled Trial of the Building Assets, Reducing Risks Model in Ninth Grade

Trisha H. Borman, Hans Bos, Brenna O'Brien, So Jung Park, and Feng Liu: American Institutes for Research, Maryann Corsello: University of New England, Angela Jerabek: St. Louis Park School District

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Background

Background

- Compared with students who graduate from high school, ninth-grade students who do *not* graduate tend to have:
  - Greater stress factors in their lives (Zaff, et al., 2016)
  - Less interest in school (Rumberger & Rotermund, 2012)
  - Lower levels of self-perceived academic competence (Davis, et al., 2014)
  - Lower self-esteem (Neild, Stoner-Eby, & Furstenberg, 2008)
  - More disruptive behavior problems (Neild, Balfanz, & Herzog, 2007)
  - More disciplinary referrals (Bruce, et al., 2011)
  - Lower rates of attendance (Bruce, et al., 2011)
  - Lower grades (Allensworth & Easton, 2007; Bruce, et al., 2011)
  - Fewer credits earned (Kemple, Segeritz, & Stephenson, 2013)

Background

- Isolation and emotional stress can cause teachers to experience depression, exhaustion, reduced empathy, and a lack of feelings of personal accomplishment (Halbesleben, 2006; Mahan et al., 2010).
- Strong student–teacher relationships can yield increases in student attendance, academic performance, and decreases in student behavior problems (Allen, Pianta, Gregory, Mikami, & Lun, 2011).
  - The researchers conducted a randomized controlled trial (RCT) in which secondary school teachers were given a year of coaching on effective teaching and student–teacher interactions. After a year, students with teachers in the experimental group scored significantly higher on year-end achievement tests than students in the control group. The quality of student–teacher interaction was a significant mediator of student achievement.

Background

- Few professional resources are designed to promote positive peer relations and interpersonal problem solving among teachers (Zins et al., 2004).

- With core components derived from research, the Building Assets, Reducing Risks (BARR) model, developed approximately 15 years ago, supports teachers and students in ways that address issues of teacher burnout and student failure.

BARR Model

- BARR 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.

BARR Model

BARR consists of eight core strategies

- Strategy 1: Relationship-Building Professional Development for Teachers, Counselors, and Administrators
- Strategy 2: Restructuring the High School Course Schedule
- Strategy 3: Whole Student Emphasis in Instructional Reform
- Strategy 4: Block Meetings, Collaborative Problem Solving
- Strategy 5: Developmental Assets Curriculum (I-Time)
- Strategy 6: Risk Review for Persistently Failing Students
- Strategy 7: Contextual Support (Focus on Leadership)
- Strategy 8: Parent Involvement to Support High School Reform

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 (Corsello, Sharma, & Jerabek, 2015).

Prior Research on BARR

- 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 (21%) than those not assigned to BARR (32%).
  - 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.

Source: Corsello, Sharma, & Jerabek, 2015.

Study Design

Study Overview

- Three cohorts of schools
  - 2014–15, 2015–16, and 2016–17
  - 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 (e.g., performance on standardized tests and credits earned)
  - Student and teacher perceptions

Research Questions

- What is the impact of BARR on ninth-grade students' academic achievement as measured by NWEA mathematics and reading 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 ratings of proximal measures of student achievement (e.g., teacher self-efficacy and use of data) differ between BARR and non-BARR teachers?
- 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?

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 academic teachers of Grade 9 students
- Interview data from 35 core academic teachers
- Interview data from three BARR coordinators
- Observation data from spring site visits to each school

Results: Cohort 1 (2014–15)

Cohort 1 Sample

- Three schools were included: one in rural Maine and two in suburban California.
- A total of 1,209 students were randomly assigned to experimental condition prior to entering ninth grade.
  - BARR students = 605
  - Control students = 604
- Student sample demographics include the following:
  - Minority students (72%), Students eligible for free or reduced-price lunch (74%), English language learners (9%), Special education students (7%)
- Thirty-five teachers (19 BARR and 16 control) were included in analysis.

Implementation Fidelity (Cohort 1)

BARR Key Component	Percentage of Schools at Adequate or High Levels of Implementation
Professional Development	67%
Restructuring Ninth Grade	100%
Whole Student Emphasis	100%
Block/Team Meetings	100%
Developmental Assets Curriculum (I-Time)	67%
Risk Review	100%
Contextual Support	100%
Parent Involvement	100%

Sources: Based on BARR coordinator structural reviews and observations of BARR practices during spring site visits at three schools.

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—Assessments

NWEA MAP Reading and Mathematics scores

Outcome Measures	Trt	Ctrl	Diff	*p* Value	Effect Size
Reading					
- Raw score	221.17	219.55	1.62*		
- Standardized score	0.06	-0.06	0.12*	.03	0.12
Mathematics					
- Raw score	227.43	227.01	0.42		
- Standardized score	0.01	-0.01	0.03	.59	0.03
Sample size	*449*	*458*			

The full OLS model included school-level variables and student-level factors as covariates: pretest scale scores in Reading and Mathematics; gender; ethnicity; and English language learner, special education, and free or reduced-price lunch status.

Student Outcomes—Credits Earned

Outcome Measures (%)	Trt	Ctrl	Diff	*p* Value	Effect Size
Total core credits earned	81.9	73.8	8.0**	<.001	0.08
- ELA credits earned	83.3	69.8	13.5**	<.001	0.14
- Science credits earned	85.4	70.9	14.5**	<.001	0.15
- Math credits earned	77.1	80.9	−3.8	.07	−0.04
Passing all core courses	64.0	47.0	0.17**	<.001	0.17
Sample size	*533*	*520*			

Student Outcomes—Survey

Construct	Scale Scores		Diff	*p* Value	Effect Size
	Trt	Ctrl			
Expectations and rigor	51.6	50.5	1.1	.10	0.11
Engagement	50.4	49.7	0.7	.32	0.07
Supportive relationships	51.7	48.5	3.2**	<.001	0.32
Social and emotional learning	51.8	52.0	−0.2	.80	−0.02
Sense of belonging	51.6	51.2	0.4	.56	0.04
Grit	52.3	52.8	−0.5	.43	−0.05
Sample size	*456*	*423*			

Teacher Outcomes

- Teacher surveys
  - View of students' actual behavior, commitment, and attitudes
  - Perception of potential student behavior, commitment, and attitudes
  - View of the school's supports
  - Interaction with parents
  - Teacher self-efficacy
  - View of student accountability
  - Collaboration with and view of colleagues
  - Use of data
- Teacher interviews
  - Professional development
  - Ninth-grade structure
  - Block or team meetings
  - Whole student approach
  - I-Time or other social-emotional learning (SEL) activities
  - Risk review or student referrals
  - Parent involvement
  - Contextual support

Teacher Outcomes—Survey (*n* = 32)

Construct	Scale Scores		Diff	*p* Value	Effect Size
	Trt	Ctrl			
View of students' actual behavior	54.1	45.8	8.3*	.02	0.08
Perception of student behavior	52.3	47.6	4.7	.20	0.05
View of the school's supports	52.2	47.7	4.5	.21	0.05
Interaction with parents	49.7	50.3	-0.6	.87	-0.01
Teacher self-efficacy	52.6	47.4	5.2	.14	0.05
View of student accountability	50.5	49.5	1.0	.80	0.01
Collaboration with colleagues	54.3	45.7	8.6*	.01	0.09
Use of data	53.8	46.2	7.6*	.03	0.08

Teacher Outcomes—Interviews (*n* = 33)

Construct	Ratings		Diff	*p* Value	Effect Size
	Trt	Ctrl			
Professional development	3.7	3.1	0.5	.14	0.05
Ninth-grade structure	4.0	2.6	1.4*	.01	0.11
Block/team meetings	4.5	3.8	0.7	.06	0.07
Whole student approach	4.0	3.4	0.6	.08	0.06
I-Time/other SEL activities	4.2	3.6	0.6	.14	0.05
Risk review/student referrals	3.2	2.4	0.9	.09	0.06
Parent involvement	3.2	2.6	0.6	.20	0.05
Contextual support	4.5	2.6	1.9*	<.001	0.13

Caveats

- These are early findings from an ongoing three-cohort study, so they are somewhat underpowered and the story may change.
- Teachers were not randomly assigned to BARR: The effects of the program cannot be disentangled from those resulting from systematic differences in teacher effectiveness.
- Grades and related outcomes (e.g., failure rates) are not independent measures of student achievement: Effects on student learning may be confounded by effects on teacher attitudes and grading practices.

Conclusions

- The BARR model is a promising way to improve student achievement in Grade 9.
- Teacher-to-teacher relationships in high school appear to be a promising malleable factor to explore further.
- Large, multisite RCTs that use within-school random assignment offer built-in opportunities to replicate findings.
- Future RCTs on BARR or similar programs should randomize both students and teachers to avoid the attribution problems that are our most important caveat.

Next Steps

- Replication studies (Cohort 2 and Cohort 3)
- Student subgroup analyses
- Differences for various locales
- Examination of the relationship between levels of implementation and outcomes

Contact Information

Trisha H. Borman
tborman@air.org

Hans Bos
jbos@air.org

So Jung Park
spark@air.org

Brenna O'Brien
bobrien@air.org

Maryann Corsello
maryann.corsello@gmail.com

Angela Jerabek
angela.jerabek@barrcenter.org

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