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The Lost Boys: Do Single-Sex, Racially Homogenous Classrooms Benefit African American Boys?

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Background

- African American boys are more likely to be negatively stereotyped in school, to dropout, to experience harsh levels of school-based discipline, to have contact with the juvenile justice system, to be held to lower academic standards by their teachers, and to experience problematic relationships with teachers, even as early as kindergarten (Brown-Wright & Tyler, 2010; Children's Defense Fund, 2012; Downey & Pribesh, 2004).
- Racial stereotypes of African American students have affected how teachers perceive and judge students' motivation, competence, and intelligence (Graham & Hudley, 2005).
- Some educators argue that establishing all-male academies for African American boys may help to address the achievement crises these students face (Mitchell & Stewart, 2013).

Purpose of the Study

Building from the foundation of social cognitive theory (Bandura, 1997) and implicit theories of ability (Dweck & Molden, 2005), we sought to examine the math achievement and the self-beliefs of African American boys who attend (a) a racially homogenous school setting and (b) a racially heterogeneous school setting. We asked the following research questions:

- Are there significant differences in math-related self-beliefs and math achievement between school settings?
- What relationships exist between math self-efficacy, implicit beliefs about math ability, and math achievement in each setting?
- How well do math self-efficacy and student implicit beliefs about math intelligence predict student math achievement?

Method

Participants, Materials, and Procedure

- Participants were 218 African American boys in Grades 4-9 from two middle schools in the Southeastern United States. The first group of boys in our study ($n = 130$) attended a typical, co-ed, public middle school (i.e., heterogeneous setting). The second group of boys ($n = 88$) attended a public academy designed specifically for African American male youth (i.e., homogeneous setting). The academy was situated within but functioned independently from another public middle school.
- Students completed an online survey in Spring 2013 about their motivation in mathematics. The current study focuses on questions students answered about their math self-efficacy and their implicit beliefs about learning mathematics. Responses to items were recorded on a six-point Likert-type scale, ranging from 1 (*definitely false*) to 6 (*definitely true*).
- Mathematics achievement was measured with a math assessment administered at the end of the 2012-2013 school year to all students in the school district.



Analyses

- To address our first research question, independent samples t tests were run to determine whether significant mean differences in mathematics achievement, mathematics-related general self-efficacy, and implicit beliefs about learning mathematics existed between boys attending school in the African American male homogenous setting and boys attending school in the typical public school.
- Bivariate correlation analyses were conducted for both groups to answer our second research question.
- To address our last question, multiple linear regressions were used to examine the relationship between the mathematics general self-efficacy, implicit beliefs about mathematics intelligence, and mathematics achievement.

Results

Table 1
Independent Samples T Test for African American Boys in Homogenous and Heterogeneous Classroom Settings

Motivation and Achievement Variables	Homogenous Setting ($n = 88$)		Heterogeneous Setting ($n = 130$)		t
	M	SD	M	SD	
Informational Sources of Self-Efficacy					
Mastery Experience	4.44	1.24	3.94	1.11	2.99**
Social Persuasion	4.40	1.31	3.97	1.23	2.36*
Vicarious Experience	4.26	1.04	4.11	1.01	1.24
Physical Arousal	2.70	1.31	3.15	1.26	2.49**
General Math Self-Efficacy	4.91	1.11	4.27	0.97	4.31***
Self-Efficacy for Self-Regulated Learning	4.54	1.05	4.24	1.05	1.96*
Math Skills Self-Efficacy	5.13	0.92	4.50	0.78	1.94*
Implicit Beliefs about Math Intelligence	4.43	1.18	4.18	1.10	1.53
Math Achievement	228.54	14.61	222.09	16.72	2.63**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 2
Correlations Among Mathematics Self-Efficacy, Implicit Theories of Ability, and Achievement in the Homogenous Classroom Setting

Variables	1	2
1. Mathematics Self-Efficacy	---	
2. Implicit Theories of Mathematics Ability	.34**	---
3. Mathematics Achievement	.46***	.24

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3
Correlations Among Mathematics Self-Efficacy, Implicit Theories of Ability, and Achievement in the Heterogeneous Classroom Setting

Variables	1	2
1. Mathematics Self-Efficacy	---	
2. Implicit Theories of Mathematics Ability	.23*	---
3. Mathematics Achievement	.16	.37***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4
Regression Analyses Predicting Mathematics Achievement by Classroom Setting

Predictor Variable	Classroom Setting	
	Homogenous ($n = 65$)	Heterogeneous ($n = 108$)
Constant	189.15	193.42
Mathematics Self-Efficacy (β)	0.43***	0.09
Implicit Theories of Mathematics Ability	0.17	0.351***
R^2	0.24	0.14
F	9.94***	8.91***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Key Findings – Homogeneous Setting

- Students attending the all male academy reported higher levels of math-related self-efficacy and had higher math achievement scores.
- Students also reported having higher levels of mastery experience, social persuasion, and lower levels of physical arousal.
- Self-efficacy predicted students' math achievement scores, but implicit theory of ability did not.

Key Findings – Heterogeneous Setting

- Students attending the traditional public school reported lower levels of math-related self-efficacy and math achievement.
- Students also reported having lower levels of mastery experience, social persuasion, and higher levels of physical arousal.
- Implicit theory of ability significantly predicted math achievement, but self-efficacy did not.

Conclusions

- Overall our findings are consistent with previous research that self-efficacy and implicit theories about ability influence achievement (Dweck, & Molden 2005; Williams & Williams 2010).
- Homogeneously-grouped settings may provide key culture-specific supports that help African American male students develop positive self-beliefs and learning behaviors that contribute to achievement.
- Students in homogeneously-grouped settings may benefit from interacting with math teachers who are more effective at fostering self-efficacy as well as growth mindsets with their students (i.e., praising effort rather than ability, giving strategy-oriented corrective feedback, giving challenging assignments that communicate high teacher expectations of student ability).
- Students in math classrooms where a fixed mindset of math ability is fostered may benefit less from their self-efficacy beliefs overall, and their math achievement may become more dependent on their beliefs about their math-related intelligence and abilities.

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