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## Introduction

**Attributions Matter!** When students attribute their academic successes to their ability, it has a positive impact on their classroom engagement and academic achievement (Swinton, Kurtz-Costes, Rowley, & Okeke-Adeyanju, 2011).

**How do students form attributions?** Theorists have suggested that one influence on causal attributions is cultural stereotypes because they serve as a source of information about the causes of outcomes (Brandt & Reyna, 2010).

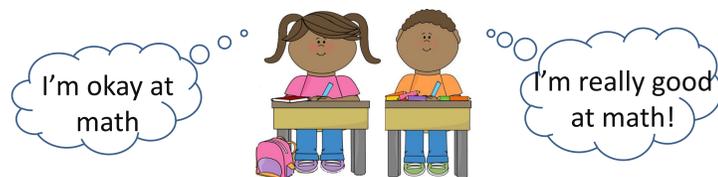
**What's the evidence?** Prior research has shown that African American students' ability attributions in math and English are consistent with gender stereotypes in those subjects, with boys more likely than girls to attribute math success to math ability, and to attribute English failures to lack of verbal ability (Swinton et al., 2011).

**The current study:** In this study, we explored the relation between students' reports of their math and English gender stereotypes and the extent to which students attribute success to ability in those domains from middle school through high school.

## Hypotheses

We hypothesized that students' average ability attributions would be consistent with traditional academic stereotypes favoring boys in math and girls in English.

We also hypothesized that students' endorsement of gender stereotypes in math and English in 7<sup>th</sup> and 10<sup>th</sup> grade would predict their success ability attributions in 10<sup>th</sup> grade and 12<sup>th</sup> grade in each respective academic subject.



For example, we predicted that girls who endorsed traditional math stereotypes (favoring boys) would report weaker success ability attributions in math than girls who did not endorse those stereotypes, whereas boys who endorsed math stereotypes would report stronger ability attributions than boys who did not. We anticipated a similar stereotype by gender interaction for English, with patterns favoring girls.

## Method

### Participants

Participants were 565 African American students (314 girls, 251 boys) surveyed in Grades 7, 10, and 12.

### Measures

**Success Ability Attributions (math/English):**

When I do well in math, it is because I am really good at math  
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

**Group Competence Measure (Stereotype Endorsement).**

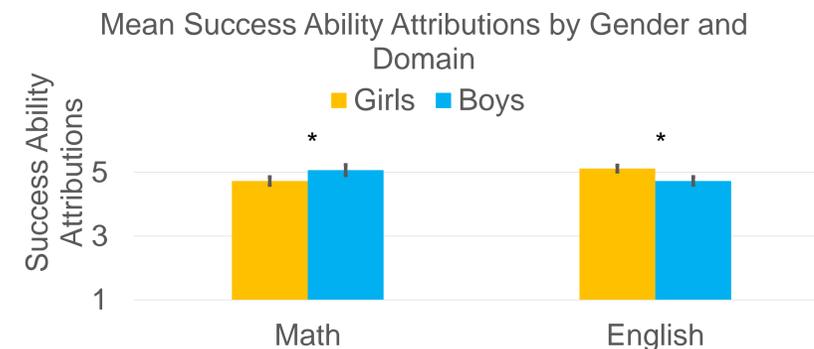
I think that in **MATH** girls do this well:

Not well at all ←-----|-----→ Very Well

Achievement was measured using course grades obtained in Grades 10 and 12 through school transcripts.

## Results

A repeated measures ANOVA yielded a significant Gender x Domain interaction,  $F(1, 162) = 9.04, p = .003$ , such that girls were significantly less likely than boys to attribute math success to math ability, and more likely to attribute English success to verbal ability.



Note. Bars denote standard errors.

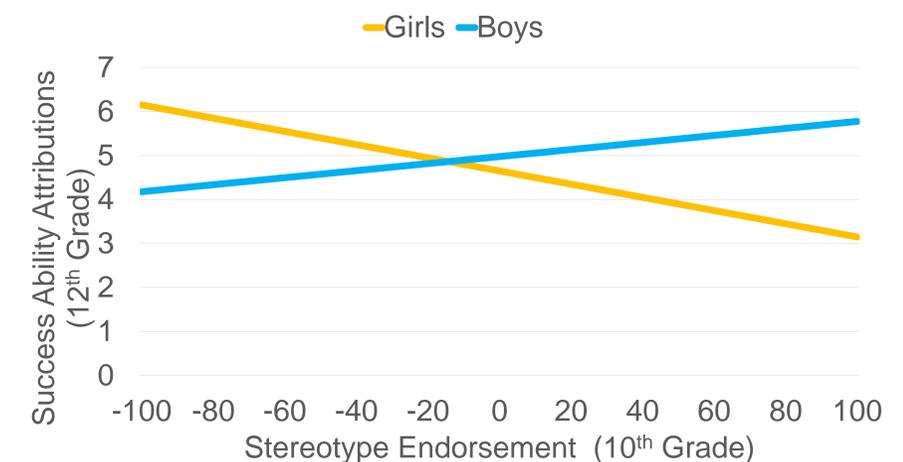
Although the anticipated interaction did not emerge using Grade 7 stereotypes, girls' Grade 10 math stereotypes predicted lower success ability attributions in Grade 12 (controlling for Grade 10 attributions and Grade 12 achievement). The relation between stereotypes and attributions was not significant for boys.

Table 1- Simultaneous Equations Analyses Predicting Success Ability Attributions in Math

Endogenous Variable	Predictor	$\beta$	SE
Grade 10 Attributions		$R^2 = .329$	
	Grade 7 Attributions	0.403***	0.047
	Grade 10 Achievement	0.044***	0.006
	Grade 7 Stereotype Endorsement	0.010*	0.004
	Gender	0.243	0.150
Grade 12 Attributions	Grade 7 Stereotype x Gender Interaction	-0.003	0.007
		$R^2 = .257$	
	Grade 10 Attributions	0.429***	0.050
	Grade 12 Achievement	0.014	0.009
	Grade 10 Stereotype Endorsement	-0.015***	0.004
Gender	0.138	0.161	
	Grade 10 Stereotype x Gender Interaction	0.022**	0.007

Note. Fit Statistics:  $\chi^2 = 22.07, p = .002, CFI = .92, TLI = .82, RMSEA = .06$   
Gender was coded 0 for girls and 1 for boys.

Math Success Ability Attributions by Stereotype Endorsement

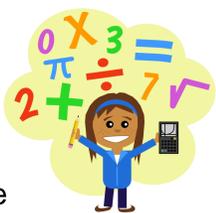


Note. Stereotype values represent difference scores (ratings of boys' math competence minus ratings of girls' math competence).

For English, we did not find any significant relations between stereotypes and attributions.

## Discussion

In general, girls were less likely than boys to attribute math success to math ability. Furthermore, girls who endorsed traditional math stereotypes (favoring boys) in 10<sup>th</sup> grade were significantly less likely to attribute their math success to math ability in 12<sup>th</sup> grade, even when controlling for previous attributions and current achievement. The same effect was not present from 7<sup>th</sup> grade to 10<sup>th</sup> grade, and no effect was present for boys.



Although boys were less likely than girls to attribute English success to verbal ability, there was no significant relation between students' stereotype endorsement and their ability attributions regarding English successes.

Our findings suggest that African American girls may be particularly vulnerable to gender stereotypes about math, and that these stereotypes may lead them to downplay their ability in spite of their math successes.

## References

- Brandt, M. J., & Reyna, C. (2010). Stereotypes as attributions. In Eleanor L. Simon (Ed.), *Psychology of stereotypes*. Nova Science Publishers.
- Swinton, A. D., Kurtz-Costes, B., Rowley, S. J., & Okeke-Adeyanju, N. (2011). A longitudinal examination of African American Adolescents' attributions about achievement outcomes. *Child Development, 82*(5), 1486–1500. <http://doi.org/10.1111/j.1467-8624.2011.01623.x>
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