

## PREDICTORS OF ACHIEVEMENT IN AFRICAN AMERICAN STUDENTS AT RISK FOR ACADEMIC FAILURE: THE ROLES OF ACHIEVEMENT VALUES AND BEHAVIORAL ENGAGEMENT

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The achievement gap between African American and European American youth is a pervasive problem in the United States. This study explored how achievement values and behavioral engagement affect the academic attainment of an academically at-risk sample of 167 African American youth in late elementary school. Results indicate that achievement values do not have a significant influence on engagement or achievement in late elementary school. However, behavioral engagement significantly influenced math achievement from Grades 4 to 5. The implications of these findings are discussed. © 2013 Wiley Periodicals, Inc.

The racial/ethnic achievement gap between European American and African American youth is well documented. Considerable research indicates that racial/ethnic achievement disparities begin prior to school entry and persist through secondary and postsecondary education (Matthews, Kizzie, Rowley, & Cortina, 2010; Yeung & Pfeiffer, 2009). National statistics indicate that, on average, African American youth score 26 points lower on standardized reading and mathematics tests than do European American youth. Moreover, in 2009, only 16% and 14% of African American fourth- and eighth-grade students performed at the proficient level in reading and mathematics, relative to 42% and 41% of European American students, respectively (Aud et al., 2010). Similar trends have been observed in African American and European American students' secondary and postsecondary educational attainment, with national statistics reflecting an elevated high school dropout rate and lower rates of college completion for African American students (Aud et al., 2010). These findings signal the importance of identifying malleable academic behaviors and psychological processes that can be targeted for intervention to narrow the racial/ethnic achievement gap.

Although there is a generous body of literature comparing the academic performance of African American youth to that of European American youth, little is known about the complexity and culturally specific academic experiences of African American children (Hill, 1997; Srin & Rogers-Srin, 2005; Tatum, 1987). Examining influences that exclusively impact the achievement of African American youth can provide insight into protective factors that foster achievement in this population. Therefore, the purpose of this study was to identify psychological and behavioral mechanisms that influence achievement in an academically at-risk sample of African American youth.

### EFFECTS OF ACHIEVEMENT VALUES ON ACHIEVEMENT

Multiple theories have been proposed to explain the persistent racial/ethnic achievement gap between African American and European American youth. Given that African American youth are

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more likely to live in poverty (U.S. Census Bureau, 2007), some suggest that the gap is attributable exclusively to low socioeconomic status (SES; Magnuson, Rosenbaum, & Waldfogel, 2008). Unfortunately, programs and strategies to reduce the effect of low SES on African American students' achievement have not been forthcoming. This has led researchers to investigate other alterable variables that might explain the underachievement of this group of students, including the degree to which African American youth value education.

Valuing of school refers to how one perceives the utility of everyday schooling in shaping one's future success (Vokel, 1996). Thus, the expectancy-value model of achievement suggests that the more students find school interesting or important to their future goals, the more likely they are to invest or exert energy in school (Eccles et al., 1983). Indeed, empirical evidence from majority European American samples suggests that achievement values are associated with student engagement, persistence in schoolwork, and school performance (Pintrich & DeGroot, 1990; Roeser, Strobel, & Quihuis, 2002; Rouse & Austin, 2002). However, to date, many of these findings have not been supported for African American youth.

### *Disidentification*

Given the perceived importance of achievement values to academic performance, some researchers have attributed African American youths' underachievement to their devaluing of school, or academic disidentification. Some scholars attribute this disidentification to the perception of many African American youth that success in school is associated with acting White (acting White theory; Fordham & Ogbu, 1986). Others propose that African American youth do not identify with school and do not value education because their self-esteem is not affected by their academic performance (Osborne, 1995, 1997).

In his qualitative investigation of African American youth attending an affluent school district, Ogbu (2003) found that some African American youth reported not exerting their full effort on academic-related tasks. Others noted that academic pursuits were not as valuable to them as were other areas of interest, such as sports. These findings might be explained by some African American youths' adoption of stereotypical messages surrounding Black culture and the application of these stereotypes to their conceptualizations of what it means to "act Black" (Ford, Grantham, & Whiting, 2008; Peterson-Lewis & Bratton, 2004).

Some African American youth perceive acting Black as underachieving, not attending class, and being street-smart (Ford et al., 2008; Peterson-Lewis & Bratton, 2004), in other words, being "disengaged" from school. Although not directly assessed, it is possible that students might attribute behaviors contributing to academic success (i.e., academic engagement) to acting White, the counter of acting Black.

Osborne (1995, 1997) found indirect evidence for the disidentification hypothesis for African American youth using a national longitudinal data set of eighth-grade students. In contrast to European American youth, Osborne observed that African American middle school students' self-esteem was not impacted by their low school performance and concluded that they consequently devalued achievement. Similarly, Taylor and Graham (2007) and Graham, Taylor, and Hudley (1998) suggested that middle school African American males do not value achievement because they wish to be like and admire peers who are not high achieving. Their conclusion was based on the results of peer nominations, whereby youth were asked to choose students whom they admired and wanted to be like.

### *Shortcomings of the Disidentification Hypothesis*

Although the academic disidentification hypothesis provides one explanation for the underachievement of African American youth, namely, that African American students do not value

education, significant limitations should be noted in studies that support this notion. Clearly, both racial/ethnic identity and African American youths' detachment of self-esteem from academic performance are plausible explanations for their underachievement. However, the negative academic attributes that youth associate with acting Black presumes that African American children who ascribe academic disengagement to Blackness have a developed racial/ethnic identity. Yet, the complexities and full development of racial/ethnic identity does not form until adolescence (Quitanna, 1998). Given this information, the disidentification hypothesis may not be an appropriate theory for understanding academic underachievement in elementary school students, which are the focus of this study.

Osborne's disidentification hypothesis is rooted in self-esteem theory (Gecas & Schwalbe, 1983), which suggests that self-esteem is affected by performance in areas of life where individuals place value. However, Osborne neglected to consider specific facets of self-esteem (i.e., academic self-esteem) within his investigation of preadolescent students. Suggesting that global self-esteem has a direct impact on specific facets of self-esteem is problematic. Research indicates that although global self-esteem is a good indicator of psychological well-being, academic self-esteem is a better indicator of academic behavior and performance (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995).

Further, although Taylor and Graham (2007) and Graham and colleagues (1998) provide an interesting method of assessing identification with school by examining academic values systems, this approach may also be problematic because it assumes that African American students' nominations of peers they admire or want to be like are based on shared academic values with nominated students. However, other behavioral characteristics may be driving the type of students whom children nominate as admirable, such as whether a given individual is popular or athletic. In sum, the assumptions and indirect assessment of this research calls for a more direct approach to measuring the achievement values of African American children.

#### DIRECT ASSESSMENT OF ACHIEVEMENT VALUES AND OUTCOMES

Task values consist of three components: (a) interest in the task; (b) perceived importance of being good at the task; (c) and the utility, or perceived usefulness, of the task for future goals (Eccles & Wigfield, 1995; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield & Eccles, 1992). Task values, a component of the expectancy-value model of child effort (Eccles et al., 1983), provide a more direct way of measuring children's achievement values than that used in previous investigations. The expectancy-value model consists of two components: (a) competence beliefs—how competent the child feels in his or her ability to perform a task; and (b) subjective task values—how much he or she values performing the task. Given that children are able to distinguish between their competency beliefs and task values as early as first grade (Eccles et al., 1993), investigating unique contributions of each on achievement is warranted.

Prior research has examined the task values of students across various age ranges (Meece, Wigfield, & Eccles, 1990; Wigfield & Eccles, 2000). Conclusions suggest that task values of achievement are most predictive of activity choice and decisions to continue with a given activity in the future. Although these studies suggest that task values are not predictive of child achievement, to our knowledge, no study has assessed all three components of task values simultaneously. It is possible, therefore, that when testing all aspects of task values collectively, the predictive ability of the task values construct on achievement might emerge. Furthermore, all identified studies examined the task value construct in lower to middle class majority European American samples. The use of components of the expectancy-value model within the current study will provide a more direct assessment of achievement values needed within African American populations. It will also provide support for the model within a different population.

## EFFECTS OF ENGAGEMENT ON ACHIEVEMENT

Not only is it important to understand how achievement values affect achievement (i.e., achievement task values), it is also important to examine how children's behaviors, thoughts, and feelings aid in their school investment and motivation and subsequently promote achievement (Appleton, Christenson, & Furlong, 2008).

School engagement consists of different thoughts and feelings that affect the effort a person exerts on a task. Fredricks, Blumenfeld, and Paris (2004) identified three types of engagement: *behavioral engagement* (participation, involvement in the classroom, and disruptive classroom behaviors); *emotional engagement* (both positive and negative affective reactions within the classroom); and *cognitive engagement* (goal pursuit and intrinsic motivation).

Behavioral engagement is believed to be the effort one puts forth toward academic tasks and is marked by academic persistence, behavioral inhibition, concentration, and interest in academics-related tasks. Behavioral engagement has been shown to be consistently predictive of child achievement (Fredricks et al., 2004) and is related to achievement scores across elementary (Alexander, Entwisle, & Dauber, 1993; Alexander Entwisle, & Horsey, 1997; Marks, 2000; Skinner, Wellborn & Connell, 1990), middle, and high school samples (Connell, Spencer, & Aber, 1994; Marks, 2000; Srin & Rogers-Srin, 2004, 2005; Taylor, Casten, Flickinger, Roberts, & Fulmore, 1994). Thus, children who exhibit greater behavioral engagement have higher achievement scores on standardized test and classroom grades (Connell et al., 1994; Marks, 2000; Skinner et al., 1990; Srin & Rogers-Srin, 2005; Taylor et al., 1994). Behavioral engagement has also been shown to be predictive of later achievement (Alexander et al., 1993, 1997).

Studies exclusively examining African American youth achievement have also reported that behavioral engagement is predictive of achievement (Connell et al., 1994; Taylor et al., 1994). In some instances, behavior engagement is the second highest predictor of achievement for African American students (Srin & Rogers-Srin, 2004). Although research examining the influence of behavioral engagement on African American students' achievement exists, studies exploring how achievement values affect engagement and subsequent achievement have not been forthcoming. Additionally, the relationship between engagement and achievement has not been examined longitudinally among African American students.

## RECIPROCAL EFFECTS OF ACHIEVEMENT ON ENGAGEMENT

It is believed that achievement is the result of reciprocal processes between the individual and the environment in which he or she interacts (Sameroff, 1975). These interactions alter both the individual and the environment, resulting in behavioral change at the individual level and the overall system level. Studies have identified effects of achievement on future engagement (Hughes, Luo, Kwok & Loyd, 2008), as well as effects of engagement on future achievement (Fredricks et al., 2004). Furthermore, studies investigating reciprocal effects between achievement and engagement have found evidence for such effects (Hughes et al., 2008; Skinner & Belmont, 1993). This study sought to replicate these findings in upper-elementary grades with an academically at-risk sample of African American children.

## EFFECTS OF ACHIEVEMENT VALUES ON ACADEMIC ENGAGEMENT

Motivation theorists suggest that values and belief systems should be investigated when studying student behavioral engagement (Eccles, Wigfield, & Schiefele, 1998). Thus, the more students consider a subject intrinsically interesting (one component of task value), the more likely they are to engage and invest in that subject (Eccles et al., 1983).

Achievement values and engagement have been studied simultaneously, yielding mixed results. That is, some studies indicate that higher levels of intrinsic achievement values affect child engagement (Pintrich & DeGroot, 1990; Roeser et al., 2002; Rouse & Austin, 2002), whereas others note that intrinsic values are not significant predictors of engagement (Wentzel, 1996).

These conflicting findings indicate a need for additional research to understand the relationships between these variables. Additionally, a model examining the relationships among achievement values, engagement, and achievement is needed as a way to better understand how these mechanisms affect academically at-risk African American students' achievement.

#### PURPOSE OF THE CURRENT STUDY

This study examined the relationship among achievement values (i.e., task values), behavioral engagement, and achievement in an academically at-risk sample of African American students in late elementary school in an effort to identify the academic processes that influence the achievement of African American students who struggle academically. Late elementary school students were targeted because it is at this point that the gap begins to widen. Additionally, the moderating effects of gender were examined to understand how the achievement of African American youth differed for males and females, given significant discrepancies noted between the achievement trajectories of African American males and females (Jordan & Cooper, 2003; Mickelson & Greene, 2006).

The following research questions were examined: (a) Do the achievement values of academically at-risk African American youth relate to their academic behavioral engagement in school? (b) Is the relationship between achievement values and achievement mediated by behavioral engagement for academically at-risk African American youth? and (c) Does the relationship between achievement values and achievement vary by gender?

It was hypothesized that achievement values would predict student behavioral engagement and that this engagement, in turn, would be associated with increases in academic achievement in reading or math. Further, it was hypothesized that the relationship between achievement values and achievement would be mediated by behavioral engagement across the three-wave sample. It was proposed that reciprocal effects between engagement and achievement would exist and that similar relationships between these variables would be found across years.

Figure 1 depicts the hypothesized model, with reading achievement as the independent variable. Given that previous research with the data set used (Hughes et al., 2008) indicated that the latent

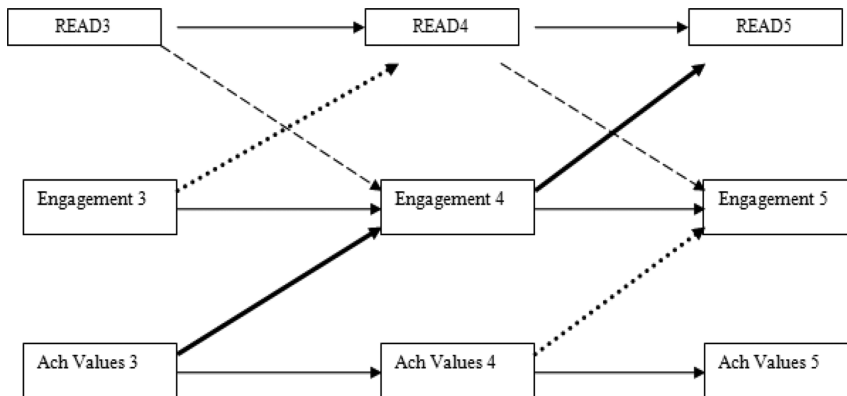


FIGURE 1. Hypothetical model. The bold lines represent target indirect effects. The dashed lines represent reciprocal effects. The dotted lines represent replicated relationships between target variables. READ = Woodcock-Johnson Test of Achievement (Ach) Reading composite score.

construct of achievement is not invariant across years, reading and math achievement, as measured by the Woodcock–Johnson Test of Achievement, was assessed in separate models. The same model was also used to assess math achievement. The use of a clearly defined and targeted construct to assess achievement values will provide a more accurate understanding of the degree to which African American children value education and thereby make an important contribution to the literature.

## METHODS

### *Participants*

Participants included a subsample of children and their classroom teachers drawn from a larger longitudinal study investigating the impact of grade retention on academic achievement (Hughes et al., 2008). First-grade children were recruited from three school districts (one urban and two small cities) in the southeastern United States across two cohorts, beginning in 2001 and 2002.

The current study included 167 academically at-risk (determined by a score below the median on a district-administered literacy measure) African American students, with data collected during the third, fourth, and fifth years of the ongoing longitudinal study. Students were selected for this study based on the inclusionary criteria of African American racial/ethnic identity (i.e., parent reported based on child race/ethnicity choices of African American, White, Hispanic, Native American, Asian and Pacific Islanders, and other) and the presence of some data on the measured variables at the time points assessed in the current study.

Attrition analysis of demographic variables, including district-administered literacy, gender, standardized full scale intelligence, standardized math and reading achievement, percentage economically disadvantaged, and eligibility for free/reduced-price lunch, suggested that the 167 African American participants in the study did not differ from the 181 African American students originally recruited for the larger study.

Of the 167 student participants, 49% were male. At entrance to third grade, their mean age was 8.62 ( $SD = .42$ ) years. Their mean score for intelligence as measured with the Universal Nonverbal Intelligence Test (McCallum & Braken, 1997) was 86.31 ( $SD = 13.83$ ). On the basis of family income, 77% of participants were eligible for free or reduced-price lunch. For 35% of the sample, the highest educational level in the household was a high school diploma or less. The ethnic racial composition of the 167 teachers who completed questionnaires (94% female) was 88.7% White, 7.5% Hispanic, 2.8% Black, and 0.9% other ethnicities. All participating teachers had a bachelor's degree; at least 41.1% had completed some graduate work.

### *Procedures*

Annual assessments were completed during students' third year in the program (hereafter referred to as Year 3). Individually administered math and reading achievement measures were administered at varying times during the school year. Each yearly assessment was separated by at least 8 months. Students' achievement values were assessed in the spring of each year. Additionally, teacher questionnaires assessing student behavioral engagement were administered in the spring of each year. Teachers received \$25 for completing and returning questionnaires.

### *Measures*

*Achievement.* The Woodcock–Johnson Tests of Achievement, 3<sup>rd</sup> edition (WJ-III; Woodcock, McGrew, & Mather, 2001) is an individually administered measure of academic achievement for individuals aged 2 years through adulthood. For the purposes of this study, Rasch-based *W* scores for Broad Reading (Letter–Word Identification, Reading Fluency, and Passage Comprehension subsets) and Broad Math (Calculations, Math Fluency, and Math Calculation Skills subsets) were used.

Rasch-based “W” scores are well suited to assessing change in achievement. The WJ-III evidences strong psychometric properties, with internal consistency reliabilities ranging from .92 to .94 (Woodcock et al., 2001).

*Teacher-Reported Behavioral Engagement.* Behavioral engagement was assessed by asking teachers to describe students’ engagement in the classroom during the spring of each academic year using an adapted version of the engagement scale created by Wellborn (Skinner, Zimmer-Gembeck, & Connell, 1998). The scale consists of 10 items assessing behavioral engagement, 4 items assessing interest, and 4 items measuring emotional engagement. On a 4-point Likert scale ranging from 1 (*not at all true*) to 4 (*very true*), teachers rate the extent to which they believe the statement presented describes the child. Example behavioral engagement items include “When this student is in class, he/she participates in class discussions” and “This student only learns what he or she wants to learn” (reverse scored).

An exploratory factor analysis (EFA) of the 10-items measure conducted with the larger data yielded a single factor that assessed behavioral engagement (i.e., effort, persistence, concentration, and interest; Chen, Hughes, Liew, & Kwok, 2009). Based on these EFA results, the mean of all items was used to create a single variable for behavioral engagement. The internal consistencies for the behavioral engagement scale for this sample were .90, .92, and .92 at Times 3, 4, and 5, respectively.

*Achievement Values.* Students’ reading and math achievement values were assessed with the reading and math subjective task values subscales from the Competency Beliefs and Subjective Task Values questionnaire (Wigfield et al., 1997). The subjective task values subscales consisted of three items for each academic domain. For each subscale, children were asked about the usefulness of the subject, their interest in the subject, and how important it is for them to be good at the subject. The three-item subjective task value subscales were used as a measure of students’ reading- and math-related achievement values.

Eccles and colleagues’ (1993) recommendation to provide graphic representations of response scales for younger children was followed. More specifically, children responded to each item by pointing on a thermometer numbered from 0 to 30. The endpoint and midpoint of each scale were also labeled with a verbal descriptor of the meaning of that scale point (e.g., the number 1 would be labeled with the words *not at all good* or *one of the worst*), the number 15 would be labeled with the word “ok,” and the number 30 would be labeled with the words *very good* or *one of the best*).

The internal consistency for the Reading scale at Times 3, 4, and 5 were .59, .68, and .62, respectively. Internal consistencies for the Math scale at Times 3, 4, and 5 were .58, .65, and .60, respectively. Given that the correlation between reading and math task values was not high, separate models were used to assess reading and math achievement values.

### *Data Analysis*

Structural equation modeling (SEM) procedures were used to assess the relationship among achievement values, behavioral engagement, and achievement. The relationship was tested across time to determine whether true mediation exists among variables using a three-time-point longitudinal design. This design allows for testing stability (Cole & Maxwell, 2003). The stability of effects assumes that within-wave correlations are of similar levels across the developmental stages measured. Previous published findings with the longitudinal sample used in this study reported stability of both achievement and engagement in younger samples (Hughes et al., 2008).

The relationship between achievement values and reading and math achievement, as well as the relationship between engagement and reading and math achievement was also examined across the three time points. This design allows for controlling of previous child achievement and engagement

when considering the across-time relationship between independent variables (achievement values and engagement) and the outcome variable (reading or math achievement) and, therefore, meets the temporal ordering criteria required for determining causality (Cole & Maxwell, 2003).

## RESULTS

### *Preliminary Analyses*

The amount of missing data on demographic or study variables ranged from 5% to 23%. The overall rate of missing data for the 167 participants was 10%. Of the study participants, 56 had complete data on all variables assessed at all three occasions, including Times 3, 4, and 5, and 111 had data on at least one of the analysis variables at each occasion. Attrition analysis showed that the 56 children with complete data did not differ from the 111 participants with some missing data at each time point on either demographic or study variables at Time 3.

This suggests that the assumption of data missing at random was reasonable. Based on these findings, missing values were estimated for those participants with missing data using full information likelihood estimation in MPlus (Version 5.2; Muthén & Muthén, 1998–2007).

### *Sample Descriptive Statistics*

Table 1 presents the means and standard deviations for the analysis variables. Table 2 lists the correlations between analysis variables. Green's (1992) SEM approach was used to determine the stability of the within-wave correlations across the time. Two models were tested to assess whether correlation differences existed. The unconstrained model (Model 1) allowed the within-wave correlations to be estimated freely. The second model was constrained, and within-wave

Table 1  
*Means and Standard Deviations of Analysis Variables*

	Girls ( <i>n</i> = 86)		Boys ( <i>n</i> = 81)		Total ( <i>N</i> = 167)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
READ3	4.71	.14	4.61	.22	4.66	.20
MATH3	4.82	.08	4.81	.12	4.82	.10
ENG3	2.86	.69	2.31	.69	2.57	.74
RTV3	23.74	6.51	23.94	5.83	23.85	6.14
MTV3	24.01	6.13	23.73	6.13	23.87	6.12
READ4	4.81	.15	4.72	.20	4.77	.18
MATH4	4.92	.08	4.90	.11	4.91	.10
ENG4	2.76	.65	2.39	.72	2.57	.71
RTV4	22.50	6.37	23.62	5.80	23.09	6.09
MTV4	24.08	5.99	23.01	6.72	24.04	6.37
READ5	4.91	.14	4.84	.21	4.88	.18
MATH5	5.00	.08	4.98	.11	4.99	.10
ENG5	2.61	.71	2.35	.63	2.47	.68
RTV5	24.23	4.59	22.71	5.87	23.45	5.32
MTV5	24.46	5.78	23.59	6.13	24.01	5.96

*Note.* The numbers in the row headings refer to the timing of assessment. READ = Woodcock–Johnson-III Broad Reading age standard score; MATH = Woodcock–Johnson III Broad Math age standard score; ENG = teacher perception of child behavioral engagement; RTV = task values related to reading; MTV = task values related to math. Due to missing data, sample varies for each variable.



Table 2  
Correlations for All Continuous Analysis Variables

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. READ3	–														
2. MATH3	.62	–													
3. ENG3	.17	.09	–												
4. RTV3	.12	.12	–.02	–											
5. MTV3	–.04	.16	–.20	.23	–										
6. READ4	.91	.55	.20	.12	–.08	–									
7. MATH4	.57	.80	.08	.02	.13	.59	–								
8. ENG4	.19	.18	.54	.03	–.49	.22	.23	–							
9. RTV4	.13	.04	.11	.21	.04	.17	.10	.20	–						
10. MTV4	–.06	.12	–.10	.17	.24	–.08	.15	.15	.15	–					
11. READ5	.86	.50	.15	.13	–.05	.94	.58	.26	.17	–.10	–				
12. MATH5	.58	.72	.24	.07	.18	.60	.81	.37	.15	.15	.60	–			
13. ENG5	.14	.08	.39	–.23	.10	.13	.12	.49	.00	.12	.08	.24	–		
14. RTV5	.27	.12	–.06	.31	.06	.31	.16	.13	.32	.16	.27	.19	.10	–	
15. MTH5	.08	.19	–.07	.23	.14	.08	.15	.18	.12	.39	.04	.23	.22	.53	–

Note. The numbers in the row headings refer to the timing of assessment. READ = Woodcock–Johnson-III Broad Reading age standard score; MATH = Woodcock–Johnson-III Broad Math age standard score; ENG = teacher perception of child behavioral engagement; RTV = task values related to reading; MTV = task values related to math.

correlations were constrained to be equal across waves. A chi-square difference test was conducted to test whether the second model provided a significantly worse fit than the first. Because the result was nonsignificant, it was assumed that the within-wave correlations were equal across waves or time points.

Correlations between achievement variables across time points were consistent with the stability effects anticipated. Additionally, the correlations between engagement across time and task values across time were consistent with the stability effects anticipated, as shown in Table 2. However, the low and nonsignificant correlations between earlier reading and math task values with future engagement and achievement (e.g., reading task values at Time 3 and reading achievement at Time 4) were inconsistent with the expected hypotheses.

### Gender Differences

To examine gender differences in children's behavioral engagement, achievement values and academic achievement, a series of one-way analyses of variance (ANOVAs) were conducted. (A  $p$  value of .01 was set to control for type I error rate.) One-way ANOVAs revealed significant gender differences for reading achievement and behavioral engagement only. With the exception of Year 5, girls outperformed boys in reading achievement: Year 3,  $F(1, 156) = 10.35, p < .001$ ; and Year 4,  $F(1, 152) = 8.97, p = .005$ .

No significant gender effects were found for math achievement or reading and math task values, but gender differences were noted in children's behavioral engagement. That is, girls exhibited higher levels of teacher-reported behavioral engagement than did boys: Year 3,  $F(1, 113) = 17.39, p = .002$ ; Year 4,  $F(1, 113) = 8.07, p = .003$ ; and Year 5,  $F(1, 145) = 7.01, p = .009$ .

### Structural Equation Models

**Reading Achievement.** We first tested the hypothesized three-wave longitudinal model (see Figure 1) with reading achievement as the dependent variable. As illustrated in Figure 1,

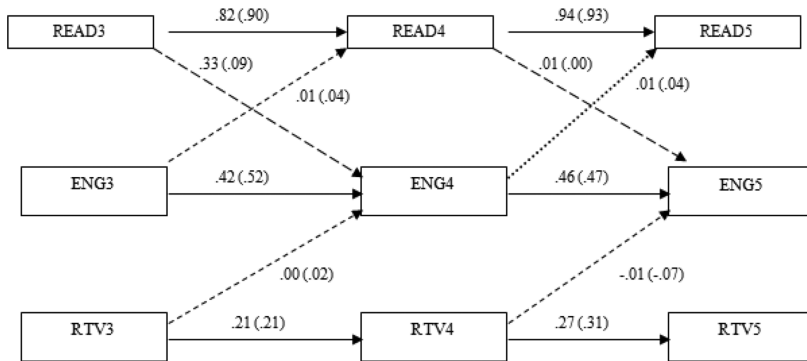


FIGURE 2. Model of reading achievement. Values are unstandardized parameter estimates, with standardized estimates in parentheses. READ = Woodcock-Johnson III Broad Reading age standard score; ENG = teacher perception of child behavioral engagement; RTV = task values related to reading. Significant paths are indicated by solid lines. Marginally significant paths are indicated by dotted lines. Nonsignificant paths are indicated by dashed lines.

teacher-reported behavioral engagement (e.g., engagement at Year 4) marginally predicted achievement at later waves (e.g., reading achievement at Year 5) when prior levels of behavioral engagement and achievement (e.g., engagement and achievement at Year 3) were controlled. The model also tested reciprocal paths from prior achievement (e.g., achievement at Year 3) to later behavioral engagement (e.g., engagement at Year 4) as well as paths between prior reading task values (e.g., task values Year 3) and later behavioral engagement (e.g., engagement at Year 4); however, these relations were nonsignificant.

Figure 2 presents the results of the hypothesized model with reading achievement. As illustrated, the model of reading achievement fit the data adequately,  $\chi^2(18) = 32.94$ ,  $p < .01$ , comparative fit index (CFI) = .97, root mean square error of approximation (RMSEA) = .07, and standardized root mean square residual (SRMR) = .09. Figure 2 presents all unstandardized parameter estimates and the standardized estimates (shown in parenthesis). Given that the effect of reading task values on behavioral engagement was not significant, mediation effects were not tested. All residuals were correlated between waves, although not listed here. Additionally, the direct effect of prior levels of reading task values on later reading achievement was assessed (e.g., reading task values at Time 3 and reading achievement at Time 4). The paths were nonsignificant and did not improve the measurement model and, therefore, were not included.

**Math Achievement.** The above analysis was repeated for math achievement, yielding a similar pattern of results. Differences included engagement at Year 4 significantly predicting achievement at Year 5. The model, as presented in Figure 3, fit the data adequately, with  $\chi^2(18) = 29.25$ ,  $p < .05$ , CFI = .97, RMSEA = .06, and SRMR = .11. Similar to the reading model, effects of task values on later engagement were not significant; therefore, mediation effects were not tested. Again, all residuals were correlated between waves, although not listed here. Additionally, the direct effect of prior levels of math task values on later math achievement was assessed (e.g., math task values at Time 4 and math achievement at Time 5). The paths were nonsignificant and did not improve the measurement model and, therefore, were not included. In contrast to reading achievement, behavioral engagement was predictive of math achievement when prior math achievement was controlled.

### Test of Gender Moderation

The possible moderation effect of gender between student engagement and achievement was examined. A multiple-group comparison revealed that the relationships between earlier variables

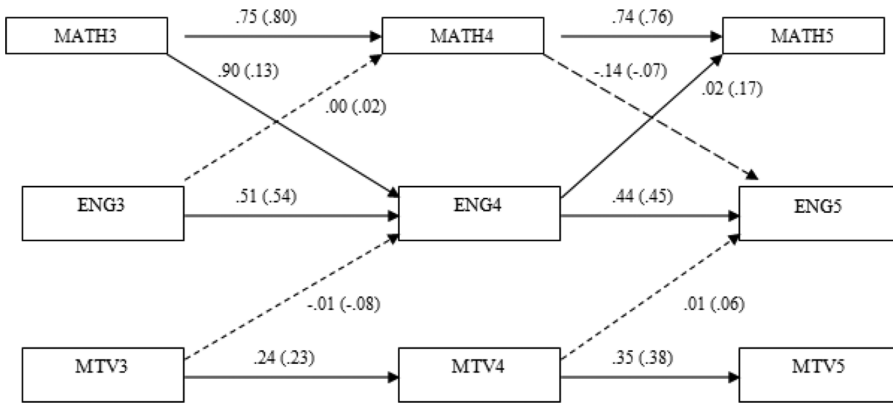


FIGURE 3. Model of math achievement. Values are unstandardized parameter estimates, with standardized estimates in parentheses. MATH = Woodcock-Johnson-III Broad Math age standard score; ENG = teacher perception of child behavioral engagement; MTV = task values related to math. Significant paths are indicated by solid lines. Marginally significant paths are indicated by dotted lines. Nonsignificant paths are indicated by dashed lines.

and later variables in Figure 2 (reading) and Figure 3 (math) were the same for both boys and girls. Additionally, examination of the standardized path coefficient between models for boys and girls confirmed that the structural paths were similar.

#### DISCUSSION

The increasing gap in achievement between European American and African American youth is a pressing concern for educators and researchers alike. Whereas a number of studies have documented the prevalence of the racial/ethnic achievement gap, few studies have explored the psychological and behavioral mechanisms that might explain the underachievement of African American youth relative to their European American peers.

The current study examined how behavioral engagement and achievement values influenced the academic achievement of academically at-risk African American youth through a three-time-point longitudinal design. Although the predicted mediating effect of behavioral engagement between achievement values and achievement was not supported, important information related to behavioral engagement emerged pertaining to a sample of African American students most at risk for academic failure. These findings could be useful for developing academic interventions to narrow the racial/ethnic achievement gap.

Specifically, we found that the relationship between engagement and achievement was significant for math achievement in later elementary school, whereas the relationship between engagement and reading achievement approached significance. The effect of behavioral engagement on math achievement from Year 4 to Year 5 suggests that African American students who are behaviorally engaged within this domain persevere academically.

The marginally significant effects of behavioral engagement on reading achievement from Year 4 to Year 5 should be interpreted with caution. The lack of significant findings for the reading achievement model might be explained by the characteristics of our sample. For this study, the inclusionary criteria were a below-average score on a district-based reading measure. It is plausible that early literacy skills might have greater predictive power of reading achievement than a child's efforts to attend and participate in class. That is, students' level of behavioral engagement alone might not be sufficient to increase their academic attainment in reading if they do not possess basic reading literacy skills. However, the finding that the results approached significance suggests that

engagement is still an important factor in reading achievement but perhaps not the primary factor. Given the increases in academic demands in fourth grade, it appears that African American students who present with academic risk but who are behaviorally engaged can succeed academically in subsequent years.

The assessment of each study variable at different time points permitted strong tests for bidirectional causal pathways. This study was able to control for previous levels of achievement, behavioral engagement, and achievement values, which enabled testing of direct and reciprocal effects of behavioral engagement on achievement and achievement values on achievement. Reciprocal effects of behavioral engagement on math achievement were found from Year 3 to Year 4, but no other reciprocal effects were identified. These findings indicate that prior math achievement influences students' behavioral engagement and, in turn, being engaged in class influences students' subsequent math achievement.

Given that previous studies with the same data set identified reciprocal effects between prior engagement and later achievement in models where the outcomes were both reading and math achievement (Hughes et al., 2008), the lack of significant findings for the reciprocal effects of behavioral engagement on reading achievement might be due to the relatively small sample of the present study, which limited study power. Alternatively, the lack of findings may be due to the increased academic risk of this sample compared with the academic risk of the overall sample used in prior studies, as indicated by a lower mean IQ score of the current sample compared with the overall sample. Future research is needed to understand the reciprocal process between behavioral engagement and both reading and math achievement, as well as possible mediators of this relationship.

As hypothesized, behavioral engagement either predicted or marginally predicted achievement in reading and math models above the effects of prior engagement and achievement. Previous studies employing a similar design (Hughes et al., 2008) reported comparable findings of this effect across time in samples of first, second, and third graders. The current findings suggest that behavioral engagement is an important predictor of math achievement in late elementary school for academically at-risk African American students. Thus, intervention strategies to increase academic achievement in academically at-risk African American youth in late elementary school should include components to increase academic effort and behavioral attributes that support classroom perseverance, especially within mathematics.

Early childhood research suggests that interventions that increase children's self-regulation skills, which are the developmental underpinnings of behavioral engagement, have the potential to reduce the achievement discrepancies at school entry and through the early elementary school years (Barnett et al., 2008; Diamond, Barnett, Thomas, & Munro, 2007; McClelland, Pitz, Messersmith, & Tominey, 2010; Raver et al., 2011). Additionally, a series of studies have shown that children with high self-regulation skills in early childhood and at school entry academically outperform their peers with low self-regulation skills in kindergarten and during the early elementary grades (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003; McClelland et al., 2007; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Further, self-regulation skills have also been found to reduce the racial/ethnic achievement gap between African American males and European American males and females and between African American males and African American females (Matthews et al., 2010).

Because self-regulation skills are believed to be an early developmental manifestation of behavioral engagement, implementation of interventions that foster self-regulation during early childhood education and the early elementary years has the potential to increase a child's behavioral engagement and, in turn, impact students' academic trajectories. Based on these findings, school officials should identify and administer early intervention programs to academically at-risk African

American students that foster self-regulation or work-related skills in an effort to build African American students' behavioral engagement and academic persistence.

The predicted effects of achievement values on academic achievement or behavioral engagement were not supported by the data. The nonsignificant relationship between achievement values and achievement may be explained by research suggesting that students' attitudes and values toward school are multilayered (Mickelson, 1990). Mickelson suggests that students hold two sets of values toward their education: abstract values and concrete values. According to Mickelson (1990), the importance of abstract values about school for future goals are widely held by students, regardless of race; however, depending on the student's concrete interpretation of how education assists adults excel, students will hold a second set of values about school. If a student perceives that education is not beneficial for success, research has shown that it is concrete values that will predict achievement of minority youth (Mickelson, 1990). The measure used to assess value in this study resembles the construct of abstract values as defined by Mickelson, and the lack of findings may be explained by the type of value that was assessed.

Future studies should examine whether a relationship exists among concrete values, behavioral engagement, and achievement. It is likely that interventions targeting abstract values will not lead to increases in achievement for academically at-risk African American students. Considering Mickelson's (1990) findings, targeting concrete values in conjunction with behavioral engagement in intervention efforts would be expected to be more beneficial for increasing academic achievement of African American youth. Or perhaps both types of values should be considered simultaneously in order to understand the full effect of the construct of achievement value with African American youth. Thus, future studies should consider assessing both abstract and concrete values as a single construct to better determine the effect of students' values of achievement on student engagement and achievement.

### *Study Limitations*

The findings of the present study must be interpreted in the context of the study's limitations. Findings were obtained with a sample of students selected on the basis of scores below their school district's median on a test of early literacy. Students were from socioeconomically disadvantaged backgrounds, with at least 77% of them qualifying for free or reduced-price lunch. Thus, results might not be able to be generalized to African American children with higher literacy skills or from higher income families. However, the sample utilized in this study is one of concern to educators and policy makers alike because it represents an academically at-risk population. Therefore, study findings can provide potential avenues for interventions that enhance behavioral engagement in academically at-risk students in late elementary school.

Another limitation of the study is the small sample size. Thus, the hypothesized effects may not have been attainable because of the small sample. Given the considerable importance of identifying intervention strategies for assisting African American youth to achieve, this study should be replicated with a larger and more diverse sample of African American students from different types of school environments, with differing levels of academic skill, and from different socioeconomic backgrounds. Although we found a positive relationship between behavioral engagement and achievement outcomes, our use of a teacher-reported engagement yielded an assessment of only the observable aspects of behavioral engagement. Without self-reported behavioral engagement, insight into the intrinsic motivational mechanisms that might influence children's effort to participate and engage in class cannot be obtained. It is recommended, therefore, that future research include both teacher- and self-reported measures of engagement to obtain a complete assessment of children's behavioral engagement in school.

Finally, the scale used to measure achievement values may account for the lack of findings related to this construct. Thus, the low reliability of this scale with the current sample is a limitation. Given a higher reliability, the scale may have shown more of an effect on future engagement and achievement. Furthermore, because some literature suggests that the achievement of African American adolescents is not predicted by abstract achievement values (Mickelson, 1990) and the scale utilized in this study measured this type of achievement value, the hypothesized mediation model may have been unattainable. Future research should replicate this study, assessing concrete achievement values independently or in conjunction with abstract achievement values of African American youth to determine the independent or combined effects of these constructs on African American youths' academic achievement. Additionally, it is possible that the widely used subjective task values scale utilized in this study does not assess the construct it is intended to measure. As a result, the field may have to begin to examine other assessment tools to address abstract achievement values.

In conclusion, although a number of studies have attributed African American students' academic success to their valuing of school, for African American children who struggle academically, it appears that academic behavioral engagement may be the most important predictor of school success.

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