

Racial Differences in Teacher Perception of Student Ability

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by [Elizabeth Covay Minor](#) 2014

Background/Context: Past research has examined many factors that contribute to the blackwhite achievement gap. While researchers have shown that teacher perceptions of students academic ability is an important contributing factor to the gap, little research has explored the extent to which teacher perceptions of students academic ability are sustained over time or the extent to which teacher ratings of students social and behavioral skills are related to their perceptions of academic ability. The current study focuses on whether teacher perceptions of students academic ability and social and behavioral skills differ by student race and the extent to which ratings at the beginning of the school year explain racial differences in perceptions of academic ability at the end of the year.

Purpose: There are two research questions addressed in this study: (1) To what extent do kindergarten teachers rate black and white students academic ability and social and behavioral skills differently? And (2) to what extent do test scores, fall teacher perceptions of students academic ability, and social and behavioral skills explain racial differences in teacher evaluations of students academic ability in the spring of kindergarten?

Population: This study uses the Early Childhood Longitudinal Study-Kindergarten Cohort of 19981999 (ECLS-K) kindergarten fall and spring data. The analytic sample used in this study includes students who were in both kindergarten waves with the same teacher and who were identified as black (2,494) or white (9,891) as reported by their parents.

Research Design: This is a quasi-experimental study that uses two data points from kindergarten (fall and spring). Mean differences are used to answer the first research question, and teacher fixed-effects models are used to address the second research question.

Conclusions/Recommendations: This study finds that teachers perceived black students to have lower academic ability in fall and spring of kindergarten compared to white students as well as lower levels of social and behavioral skills. Teachers fall perceptions have lasting implications for how teachers perceive their students in the spring, and this appears to have more negative consequences for black students. Teacher reports of social and behavioral skills are more important for teacher perceptions of student ability for black students than for white students. In other words, behaving well for black students has a larger influence on teacher perceptions of students academic ability than it does for white students.

In the United States on average, black students enter kindergarten with significantly lower test scores in both math and reading compared to white students (Fryer & Levitt, 2004; Lee & Burkham, 2002). Researchers have shown that many factors contribute to the gaps in performance among black and white students including socioeconomic differences, the home environment (Fryer & Levitt, 2004; Lee & Burkham, 2002), and parent education (Phillips, Brooks-Gunn, Duncan, Klebanov, & Crane, 1998). One factor that has been shown by researchers to be important but less explored is the extent to which teacher perceptions of students academic ability are sustained over time (Jussim, Eccles, & Madon, 1996; Ready & Wright, 2011).

On average, kindergarten classroom teachers, even as early as the beginning of the school year, perceive their black students to have lower ability levels than their white students. Ready and Wright (2011) found that white students were 1.5 times as likely to be rated as having strong academic skills than weak skills, but black students were 2 times as likely to be rated as having weak skills compared to strong skills when taking into account student background characteristics including socioeconomic status, test scores, and family structure. These findings imply that some black students begin their formal schooling with their teachers having preconceived biases of their ability.

Teacher preconceived biases may influence teacherstudent interactions, including positive feedback of their performance. The importance of teacher feedback such as expectations (Cooper, 1979; Jussim & Harber, 2005) and goal setting (Hattie & Timperly, 2007) on student performance has been well documented. Teacher feedback has also been found to be related to students academic self-image (Eccles [Parsons], 1983; Gniewosz, Eccles, & Noack, 2012), self-efficacy (Eccles [Parsons],

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About the Author

- Elizabeth Minor
National Louis University
[E-mail](#)
[Author](#)
ELIZABETH COVAY MINOR is an Assistant Professor at National Louis Universitys National College of Education. She studies inequality in access to, returns to, and experiences in student opportunities to learn with a focus on racial and income group inequality.

1983), and locus of control (Agirdag, Van Avermaet, and Van Houtte, 2013) for young children and those in middle grades. If objective measures of students ability *fully* explained the racial differences in teacher perceptions of students academic ability, the association between race and teacher perceptions would be less problematic, but that is not the case.

Researchers have also found that teachers include more than academic skills in their evaluations of students including work habits, motivations, effort, and behavior, commonly referred to as social and behavioral skills (SBS) (see Farkas, Grobe, Sheehan, & Shuan, 1990). Here again, as in the instance of academic performance, teachers tend to give black students lower ratings on SBS measures than white students even when controlling for other characteristics such as students socioeconomic status, gender, age, family structure, test scores, and prior SBS (Covay & Carbonaro, 2010; Downey & Pribesh, 2004). The explanations for these differences include racial bias (Downey & Pribesh, 2004), cultural and social factors (Pigott & Cowen, 2000), and opportunities to learn SBS (Covay & Carbonaro, 2010).

But what few studies have examined is the relationship between teacher perceptions of SBS and perceptions of academic performance taking into account student ability. When explaining variation in teacher ratings of academic ability, it seems particularly useful to examine not only students academic ability but also measures of SBS. The current study focuses on whether teacher perceptions of students academic ability and SBS differ by student race and the extent to which ratings at the beginning of the school year explain racial differences in perceptions of academic ability at the end of the year.

THE IMPORTANCE OF TEACHER PERCEPTIONS OF STUDENTS

There has been considerable research examining racial differences in teacher expectations (e.g. McKown & Weinstein, 2008; Pigott & Cowan, 2000). For example, using two naturalistic cross-sectional data archives, McKown and Weinstein (2008) found that among elementary school children, teachers hold different expectations for black and white students with teachers having lower expectations for black students, which in turn is related to student performance. Pigott and Cowan (2000) used data on kindergarten through fifth graders from a study in the Rochester City School District to conduct a descriptive analysis and found that teachers had lower expectations of students academic trajectories for black students compared to white students.

While this research helps us understand how teacher expectations differ by race they are less informative about teacher perceptions of students academic ability. Teacher perceptions of students academic ability are distinct from but related to teacher expectations. Perceptions of students academic ability include the views that teachers have of their current academic ability, whereas expectations involve teachers views of students current and future academic potential. Teacher perceptions of students ability in the form of evaluations are typically understood by parents as measures of academic skills, and students who are perceived as having higher skill levels are believed to be more competent by both teachers and parents (Pallas, Entwisle, Alexander, & Stuka, 1994). Such perceptions are acted upon by teachers and parents to create a context that influences students academic self-image, which can follow the students through their schooling careers (Eccles [Parsons], 1983; Gniewosz et al., 2012).

In addition to being related to the formation of students academic self-image, researchers in the United States have also found that teacher perceptions shape how they behave toward students (Good, 1987; Good & Brophy, 1972; Tenenbaum & Ruck, 2007). In a study of first grade classrooms, Good and Brophy (1972) showed that when teachers view students as making too many demands on them, such as needing constant attention and correction of classroom behavior, they give less feedback on the students work and when they do provide feedback it is in the form of criticism. Tenenbaum and Ruck (2007) conducted a meta-analysis of research that includes racial differences in studentteacher interactions covering all grade levels. Consistently, they found that white students tend to receive more positive and neutral responses from their teachers than black students (Tenenbaum & Ruck, 2007). In sum, while teachers are often not aware that they are behaving differently toward students (Good & Brophy, 1974), researchers have found that teacher perceptions of students are related to studentteacher interactions and race.

THE ROLE OF SOCIAL AND BEHAVIORAL SKILLS

When examining teacher ratings of students academic skills, researchers tend to find that teacher reports of student achievement are fairly accurate when compared against standardized test scores (Madon et al., 1998). Placed in the context of race, Ferguson (1998) would call this conditional racial neutrality, meaning that perceptions of black and white students are informed by evidence of achievement and could be considered unbiased. In other words, teachers perceptions would be a valid assessment of students academic ability. If teacher evaluations of students academic ability are the result of actual differences in students skills, then a measure of student academic skills should explain the racial differences in teacher perceptions of students academic ability. However,

there is some indication that this might not be the case.

Ready and Wright (2011) found that achievement scores partially explain differences in teacher perceptions of students ability. Using teacher perceptions of kindergarten students literacy ability as an outcome, Ready and Wright focused on the extent to which students test scores and classroom composition helps to explain initial differences by demographic characteristics including race. They found that teachers tend to underestimate the literacy ability of black students in the fall. The baseline effect size of the black coefficient in the fall of kindergarten was -0.18 , which is reduced to -0.13 when reading scores are included. Teachers were more able to accurately assess black students' ability in the spring of kindergarten, with the baseline black coefficient having an effect size of -0.21 in the spring decreasing to -0.07 when including reading scores. These results imply conditional racial neutrality—at least in the spring.

While Ready and Wright (2011) provide insight into teacher perceptual accuracy and the improvement of accuracy over the school year, these results leave us with unanswered questions. Teachers incorporate their perceptions of students social and behavioral skills in their evaluations of ability (Farkas et al., 1990), and teachers tend to perceive students with higher levels of SBS as having higher levels of academic skills (Hinnant, OBrien, & Ghazarian, 2009). Additionally, SBS ratings have been shown to play an important role in student academic placement. For example, Tach and Farkas (2006) included measures of teacher reports of SBS in their study of ability group placement finding that students with more positive teacher reports of SBS tended to be placed in higher ability groups.

Some researchers have found that there is a black–white gap in teacher reports of SBS, with black students being rated as having lower levels of SBS despite controlling for student background characteristics such as socioeconomic status and family structure. Downey and Pribesh (2004) found that black kindergarten students have higher ratings of externalizing problem behavior (a negative behavioral measure of SBS) in addition to lower ratings on approaches to learning, (a positive behavioral measure of SBS) described as task persistence, eagerness to learn, and flexibility. These variations in approaches to learning have also been found among black and white students in third grade even when student background characteristics are taken into account (Covay & Carbonaro, 2010). If teachers incorporate SBS measures into their evaluations of students academic skills it may be that racial differences in performance can be partially explained by teacher SBS ratings, especially for black students.

In addition to unanswered questions about the role of SBS in teacher perceptions of ability, there are also unanswered questions about the extent to which beginning of the school year perceptions of ability are related to end of the year perceptions. Ready and Wright (2011) found that teachers have inaccurate perceptions of academic ability for black students at the beginning of the year. While teacher accuracy appears to be better in the spring of the school year, we know little about the implications of inaccurate perceptions of ability in the fall of kindergarten in terms of carry over to the spring. If you accounted for other factors such as ability and SBS, is it perceptions that form earlier in the year that drive end of the year perceptions?

Specifically, the study focuses on the following questions:

1)

To what extent do kindergarten teachers rate black and white students academic ability and social and behavioral skills differently?

2)

To what extent do test scores, fall teacher perceptions of academic ability, and SBS explain racial differences in teacher evaluations of students academic ability in the spring of kindergarten?

DATA AND METHODS

The kindergarten data from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) (NCES, 2006) is well-suited for the study of teacher perceptions of racial differences in kindergarten classrooms. ECLS-K is a nationally representative sample of students who entered kindergarten in the 1998–1999 school year and includes students' standardized test scores and their teachers' perceptions of their academic ability and SBS measures (see NCES, 2001, 2006, for more information).

The analysis for this study was limited to those students identified as black (2,494) or white (9,891) as reported by their parents (for more information see the NCES race composite variable).¹ Those

students identified as biracial were excluded from the analytic sample, as it would be difficult to precisely differentiate racial identities for purposes of measuring potential racial differences between academic performance and teacher perceptions of students ability and SBS. Finally, to trace and link teacher perceptions with performance the analytic sample was further restricted to black (1,988) and white (8,328) students who did not change schools or teachers between fall of kindergarten and spring of kindergarten.²

Measures

The measures of students academic ability in this study are test scores created using item response theory (IRT). The fall assessment was a two-stage model. In the first round of the assessment, students were given a routing test to provide an appropriate ability level for the second stage of testing. The IRT provided an estimated score of what students would have received if they had answered all of the possible questions despite only receiving a subset of questions (NCES, 2006).

The variables used to measure teacher perceptions of academic ability are from the Academic Rating Scales (ARS), one for Mathematical Thinking and one for Literacy and Language, which were constructed with Rasch models (see NCES, 2001). Teachers were asked to judge the extent to which students have shown particular skills on a scale from one to five with response categories of: not yet, beginning, in process, intermediate, and proficient. For instance, in Mathematical Thinking, teachers are asked to rate the extent a child has demonstrated the ability to order a group of objects for example, by ordering rods or sticks by length, or arranging paints from lightest to darkest, or musical instruments from softest to loudest. Using Rasch analysis, the item difficulty reliabilities for the ARS for Literacy and Language are 0.91 in the spring of kindergarten. For Mathematical Thinking, the item difficulty reliabilities are 0.93 in the spring of kindergarten (NCES, 2001).

In addition to ARS, SBS scales were created using teacher responses to the child specific Social Rating Scale (SRS), which ECLS-K combines into five categories approaches to learning, interpersonal skills, self-control, externalizing problem behavior, and internalizing problem behavior. The SBS scales describe teachers rating of students attentiveness, task persistence, eagerness to learn, learning independence, ability to be organized, ability to control his or her actions, and ability to get along with others. For this study, four of the five SRS composites were combined to form one measure of social and behavioral skills. Internalizing problem behavior was not included in the final SBS scale because, conceptually, it does not describe students social and behavioral skills. Instead, internalizing problem behavior describes more of an intrapersonal measure. The SBS composite measure used in this study is a sum of teacher reports of approaches to learning, interpersonal skills, self-control, and externalizing problem behavior (Cronbachs alpha for fall = .8824; for spring = .8914). High values on the SRS indicate that students exhibit these qualities very often. Because externalizing problem behavior is a negative behavior, and the others are positive, externalizing problem behavior is reverse coded so that a high value indicates that a student rarely exhibits this quality. In this way, all the measures are oriented in the same direction.

STUDENT BACKGROUND VARIABLES

Student background characteristics used include gender, family socioeconomic status (SES), family composition, and primary language spoken at home. SES is a composite measure that includes mother/female guardians education and occupation, father/male guardians education and occupation, and household income. Family composition is a dichotomous variable indicating whether or not children are in a two-parent family. This study also includes measures of whether students are repeating kindergarten³ and whether they are in an all-day kindergarten.

MISSING DATA

The current study uses multiple imputation (MI) to deal with missing data. The specific command for MI is Stata -ice- command (Royston, 2004). The dependent variables are included in the imputation equations; however, the imputed values of the dependent variables are not used in the analyses because the inclusion of imputed dependent variable values adds noise to the estimates, less accurate standard errors, and larger confidence intervals. Additionally, MI with deletion of the dependent variables reduces the chance of problems from the imputation model influencing the analyses (von Hippel, 2007).

ANALYSES

The ECLS-K data is structured so that teachers are linked to students in their classrooms, and Ready and Wright (2011) showed that that most of the variation in teacher perception of student

ability is within classrooms rather than between classrooms. Thus in order to examine what is occurring within the classroom, we must hold the classroom characteristics such as class size and socioeconomic composition constant, which is achieved through a teacher fixed-effects model. The fixed-effects model allows us to examine how the same teacher perceives different students by holding the teacher characteristics like race constant. Additionally, this modeling strategy allows us to account for the interdependence of teacher perceptions of students within the same classroom. The fixed-effects model was estimated using the xtreg command in Stata.

RESULTS

RACIAL DIFFERENCES IN TEACHER EVALUATIONS OF STUDENTS ACADEMIC ABILITY

Descriptive statistics are presented in Table 1. With respect to test score performance, while both black and white students improve from fall to spring, black students still have lower test scores than white students in the spring. In the fall, black students are 0.42 of a standard deviation lower than white students in reading and 0.64 of a standard deviation lower in math. The racial gap in test scores remains in the spring: black students remain at 0.42 of a standard deviation below white students in reading and increase to 0.69 of a standard deviation below in math.

Teacher perceptions of academic ability mirror those of test scores. Teachers rate black students as having significantly lower levels of academic ability than white students in both fall and spring. In the fall, teachers rate black students 0.44 of a standard deviation lower than white students on Literacy and Language and 0.52 of a standard deviation lower than white students on Mathematical Thinking. Teachers rate both black and white students higher in the spring compared to their rating in the fall for both subjects. Additionally, the blackwhite gap in teacher ratings of Literacy and Language and Mathematical Thinking narrowed in the spring of the school year, to 0.35 and 0.44 of a standard deviation, respectively. In other words, teacher perceptions of students academic ability are more similar for black and white students in the spring than in the fall; however, teachers still perceive black students to have lower academic ability than white students at both time points in both subjects.

Table 1. Descriptive Statistics

	Black (N = 1,988)		White (N = 8,328)		Total (N = 10,316)		Minimum	Maximum
	Mean	SD	Mean	SD	Mean	SD		
<i>Race</i>								
Student Black					0.193	--	0	1
<i>Outcome Variables</i>								
<i>Teacher Rating</i>								
Literacy Spring	3.230*** (N = 1,966)	0.773	3.504 (N = 8,247)	0.769	3.452 (N = 10,213)	0.778	1	5
Math Spring	3.337*** (N = 1,943)	0.852	3.705 (N = 8,169)	0.807	3.635 (N = 10,112)	0.829	1	5
<i>Academic Skills</i>								
<i>Teacher Rating</i>								
Literacy Fall	2.348***	0.709	2.661	0.689	2.601	0.706	1.02	4.74
Math Fall	2.318***	0.763	2.738	0.793	2.657	0.809	1	5
<i>Test Scores</i>								
Reading-Fall	26.722***	7.979	30.860	10.053	30.062	9.825	14.85	124.28

Reading-Spring	36.934***	11.441	42.629	13.794	41.532	13.560	16.06	138.49
Math-Fall	19.391***	6.405	25.095	9.081	23.996	8.918	7.49	88.67
Math-Spring	27.995***	9.179	36.020	11.658	34.473	11.660	8.73	102.59
<i>Teacher Reports of Social & Behavioral Skills</i>								
Fall	11.765***	2.276	12.665	2.128	12.491	2.186	4	16
<i>Student Background Characteristics</i>								
Female	0.499	--	0.484	--	0.487	--	0	1
SES	0.361***	0.750	0.243	0.733	0.126	0.774	4.75	2.67
Siblings	1.527***	1.324	1.392	1.019	1.418	1.086	0	10
Home Language-English	0.989	--	0.986	--	0.986	--	0	1
Two Parents	0.402***	--	0.852	--	0.765	--	0	1
Repeat Kindergarten	0.051*	--	0.039	--	0.041	--	0	1
All Day Kindergarten	0.798***	--	0.518	--	0.572	--	0	1

Note. Significant differences are between black and white students with $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$ Results are unweighted.⁷

While there is a notable reduction in the racial gap in teacher perceptions of students academic ability, there is little change in teacher reports of SBS from fall to spring. Teachers rate black students significantly lower in SBS in both the fall and the spring. In the fall of kindergarten, black students are 0.42 of a standard deviation below white students in teacher reports of SBS. In the spring, the racial difference is not significantly different (0.42 to .046). Thus, teacher reports of SBS remain fairly steady from the beginning of the school year unlike teacher perceptions of academic ability, which is perplexing given the socialization that occurs in schools.

RACIAL DIFFERENCES IN TEACHER PERCEPTIONS OF MATHEMATICAL THINKING

The descriptives provide us with a pattern of students test scores and teacher perceptions of academic ability and SBS. Across all three measures, black students have lower values than white students. The next set of analyses moves more deeply into the racial differences that we see in the descriptives to examine why black students are perceived to have lower academic ability and the relationship among test scores and teacher perceptions of students SBS and academic ability.

Table 2. Predicting Spring Teacher Rating of Student Math Ability

DV: Teacher Rating of Student Math Ability					
	Model 1	Model 2	Model 3	Model 4	Model 5
Black	-.279*** (.030)	-.059** (.022)	-.029 (.020)	-.017 (.021)	.055 (.057)
Math Test Score (centered) (Spring)		.047*** (.0006)	.032*** (.0007)	.032*** (.0007)	.032*** (.0007)
Math Test Score (centered and squared) (Spring)		-.0008*** (.00002)	-.0006*** (.00002)	-.0006*** (.00002)	-.0006*** (.00002)
Teacher Reports of Social & Behavioral Skills (centered) (Fall)			.028*** (.003)	.025*** (.003)	.019*** (.003)
Teacher Perceptions of Math (Fall)			.389*** (.011)	.383*** (.011)	.387*** (.012)

<i>Student Characteristics</i>					
Female				.029**	.029**
				(.010)	(.010)
Home Language-English				.036	.033
				(.048)	(.048)
SES				.035***	.036***
				(.008)	(.008)
Two Parent Family				.025	.024
				(.014)	(.014)
Number of Siblings				-.010*	-.009
				(.005)	(.005)
<i>Timing</i>					
Student Repeat Kindergarten				-.068*	-.069*
				(.027)	(.027)
All Day Kindergarten				.994*	1.022*
				(.435)	(.435)
<i>Interactions</i>					
Black* Teacher Reports of Social & Behavioral Skills					.027***
					(.006)
Black*Teacher Fall Perceptions of Math Ability					-.023
					(.021)
Constant	3.688***	3.747***	2.683***	2.069***	2.044***
	(.008)	(.007)	(.030)	(.256)	(.257)

Note. $N = 10,112$; $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$; results are unweighted; coefficients are unstandardized.

Table 2 provides the analysis of the teacher fixed-effects models. Controlling for these teacher fixed effects, black students are rated significantly lower in Mathematical Thinking in the spring of kindergarten than white students by the same teacher (Model 1). In Model 2, when the spring standardized math test score is added the coefficient for black decreases by 79% from -0.279 to -0.059 . Even though the racial gap coefficient is reduced, black students are still rated by their teachers significantly lower than white students in the spring of kindergarten. The first- and second-order term⁴ of math test scores are both significant with the second-order term being negative, which indicates that test scores for students at the top end of the achievement distribution explain slightly less of teacher ratings of academic ability than the test scores for students at the bottom end and middle of the distribution. In other words, teachers do not tend to differentiate much between top and very top students when rating students academic ability.

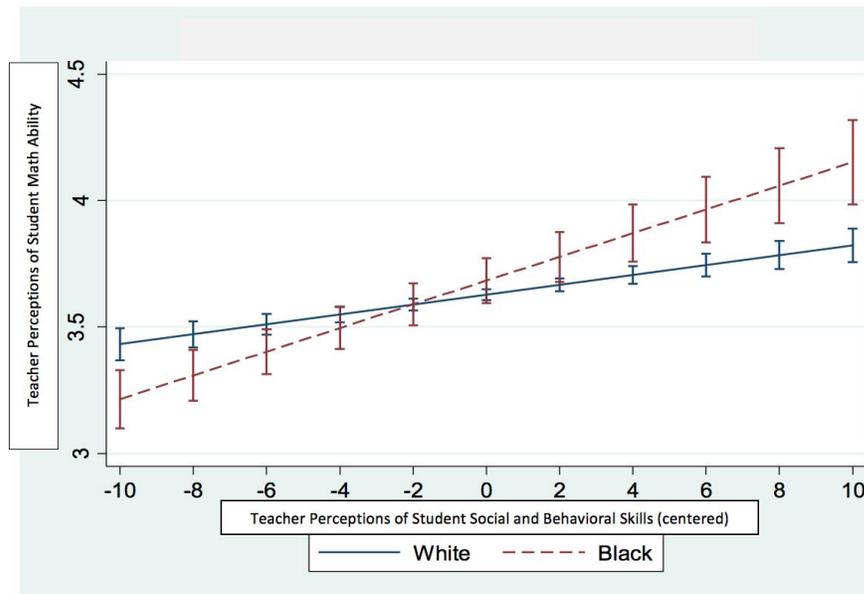
Once teacher perceptions of fall academic ability and teacher reports of SBS scores are controlled for (Model 2.3), the racial gap in achievement is no longer significant. In other words, a teacher in the spring will rate black and white students within her classroom similarly when the students have the same math test scores and are perceived to have the same fall academic ability and SBS.⁵ This indicates that teacher perceptions of racial differences remain stable over the course of the academic year. Model 2.4 controls for additional student level characteristics and the main effects are similar.

In Model 2.5, which includes interaction terms between race and teacher perceptions of academic ability and SBS from the fall, there is a significant interaction between race and SBS.⁶ The coefficient for SBS is 2.4 times larger for black students than it is for white students, suggesting that

teachers tend to incorporate SBS into their perceptions of academic ability more for black students than for white students.

Figure 1 provides an illustration of this interaction. Teacher perceptions of black students whose SBS is above average are more likely to have their mathematical skills rated higher than white students who are at or above on SBS. Put another way, black students whose teachers view them as well behaved benefit more from favorable perceptions of Mathematical Thinking than well-behaved white students.

Figure 1. Interaction Effects for Race and Teacher Perceptions of Student Social and Behavioral Skills on Teacher Perception of Student Math Ability



Note. Vertical bars indicate the 95% confidence interval.

RACIAL DIFFERENCES IN TEACHER PERCEPTIONS OF LITERACY AND LANGUAGE ABILITY

Table 3. Predicting Spring Teacher Rating of Student Literacy & Language Ability

DV: Teacher Rating of Student Literacy & Language Ability					
	Model 1	Model 2	Model 3	Model 4	Model 5
Black	-.273*** (.030)	-.079*** (.020)	-.039* (.018)	-.034 (.018)	.053 (.052)
Reading Test Score (centered) (Spring)		.054*** (.0006)	.036*** (.0006)	.036*** (.0006)	.036*** (.0006)
Reading Test Score (centered and squared) (Spring)		-.0006*** (.00001)	-.0004*** (.00001)	-.0004*** (.00001)	-.0004*** (.00001)
Teacher Reports of Social & Behavioral Skills (centered) (Fall)			.024*** (.002)	.021*** (.003)	.019*** (.003)
Teacher Perceptions of Literacy & Language (Fall)			.443*** (.011)	.441*** (.011)	.448*** (.012)
<i>Student Characteristics</i>					

Female				.033***	.033***
				(.009)	(.009)
Home Language-English				.010	.007
				(.042)	(.042)
SES				.031***	.031***
				(.007)	(.007)
Two Parent Family				.005	.006
				(.012)	(.012)
Number of Siblings				.001	.001
				(.004)	(.004)
<i>Timing</i>					
Student Repeat Kindergarten				-.112***	-.112***
				(.024)	(.024)
All Day Kindergarten				.630	.640
				(.387)	(.386)
<i>Interactions</i>					
Black* Teacher Reports of Social & Behavioral Skills					.006
					(.006)
Black*Teacher Fall Perceptions of Literacy & Language Ability					-.034
					(.020)
Constant	3.504***	3.568***	2.378***	1.990***	1.968***
	(.009)	(.0006)	(.029)	(.227)	(.227)

Note. $N = 10,213$; $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$; results are unweighted; coefficients are unstandardized

Table 3 includes the teacher fixed-effects models with teacher perceptions of spring kindergarten Literacy and Language skills. In the spring of kindergarten, the same teacher rates black students significantly lower than white students in terms of their Literacy and Language skills (Model 3.1). Adding students spring reading test scores in Model 3.2 explains 71% of the racial difference in teacher ratings of Literacy and Language. Once again both the first- and second-order term of reading test scores is significant with the second-order term being negative implying that teachers tend to not differentiate much between those students at the top and those students at the very top when forming their perceptions of students academic ability. Model 3.3 adds teacher perceptions of fall Literacy and Language ability and SBS. The combination of student test scores and teacher perceptions of academic skills and reports of SBS reduces the racial difference in teacher ratings of spring kindergarten Literacy and Language. However, as in Model 3.2 black students are still rated significantly lower than white students despite having the same test scores.

Model 3.4 adds student background characteristics. Once student background characteristics are added to the models, there are no longer statistically significant differences in how teachers would rate black students and white students. Additionally, there are no significant interactions between race and teacher perceptions for predicting teacher ratings of spring Literacy and Language (Model 3.5).

DISCUSSION

Racial differences in teacher perceptions of academic ability are mostly explained by test scores, teacher ratings of SBS, and teacher perceptions of academic ability from the beginning of the school year. In the spring of kindergarten, teacher will rate black and white students as having the same academic ability if these students have the same test scores and fall teacher perceptions of academic ability and SBS. On the surface, this finding seems like a positive outcome. However, this does not mean that there is not inequality present in teacher perceptions of students academic ability.

This study shows that fall perceptions have lasting implications for how teachers perceive their students in the spring and this appears to have more negative consequences for black students. It would seem that the racial bias persists despite additional information regarding performance. That is despite the fact that teachers gain more evidence of students ability as the school year progresses they still rely heavily on their perceptions formed at the beginning of the school year even though these are inaccurate. Even with similar test scores, students whom teachers perceive to have lower academic skills and SBS in the fall of kindergarten tend to be the students who teachers perceive to be of lower ability in the spring of kindergarten.

An additional critical finding is the role of teacher SBS reports. In each of the final models there are interaction terms for fall teacher perceptions of academic ability and teacher reports of SBS by student race with a significant positive interaction term between teacher reports of SBS and black students for Mathematical Thinking, suggesting that teacher reports of SBS are more important for teacher evaluations of student ability for black students than for white students. In other words, behaving well for black students has a larger influence on teacher perceptions of student academic ability than it does for white students. This also indicates that if black students are rated by their teachers as behaving well at the beginning of the school year this may have lasting implications on teacher perceptions of their academic ability.

Perhaps one explanation for this may be that teachers seek to be objective in their evaluation of black students and are reluctant to form negatively biased initial assessments of student academic skill. If this is the case, teachers may focus more on evidence of positive SBS for black students than for white students. As Gorski (2009) finds, multicultural education courses in teacher preparation programs tend to focus on awareness and sensitivity. Why this is the case for Mathematical Thinking and not for Literacy and Language is unclear. It may be the consequence of variation in instructional activities for these two different subjects, with literacy and language being more interactive and social.

As we would expect, as students had higher test scores, teachers perceived their academic ability to be higher. However, this is only up to a point. Teachers tend to not differentiate in terms of students academic ability between those students who score high on the achievement test and students who score very high. Perhaps this is because the skills that teachers are asked about are skills that both groups of students are already proficient at thus there is not a need to differentiate between the two groups. Alternatively, teachers may have a more difficult time differentiating between the two groups but an easier time differentiating between students who do not have the skills or are only beginning to develop those skills.

Overall, these findings suggest that there are differences in teacher perceptions of students academic ability by student characteristics. Although the racial differences in teacher perceptions of academic ability are mostly explained by test scores, teacher reports of SBS, and prior perceptions of academic ability, new questions arise from these analyses, such as why students from families with higher SES are rated as having higher ability than students from families with lower SES.

One possible explanation as to why there are significant differences by SES in teacher perceptions of students academic ability is that the test is not fully capturing the skills that the teacher is evaluating. For example, past research shows that black students and students from low SES families have a smaller vocabulary than white students and students from middle/high SES families (Farkas & Beron, 2004; Hart & Risley, 1995). SES may be a proxy for vocabulary differences that teachers may be incorporating into their perceptions of students academic ability, which are not captured by tests and teacher perceptions of fall ability and SBS.

Cultural resource theory suggests that depending on the teacher–student interaction, the skills and habits that a student demonstrates may be differently rewarded (Farkas et al., 1990). Parents and students with higher SES tend to possess higher levels of the cultural capital that is valued in the school setting (Lareau, 2000). The cultural capital that a teacher may reward includes social and behavioral skills (Farkas et al., 1990). Thus, the additional student background characteristics added to the model, especially SES, may be proxies for some aspects of cultural capital related to teacher perceptions of students academic ability.

There are limitations to this study. An objective measure of SBS would provide more robust evidence of explanations of teacher perceptions of students academic ability; however, objective measures of SBS are not in the data. There are parental reports of behaviors that correspond to the behaviors on which teachers report; however, the parental reports of SBS have lower reliabilities than teacher reports. Despite the limitations of the data used in this study, there are several important findings. Most importantly, early school year perceptions of academic ability and SBS contribute to how teachers view their students ability throughout the school year. How students behave in the classroom in the beginning of the school year is key to how teachers perceive their academic ability, especially for black students

APPENDIX

Table A1. Predicting Spring Teacher Rating of Student Math Ability (Standardized Coefficients)

DV: Teacher Rating of Student Math Ability

	Model 1	Model 2	Model 3	Model 4	Model 5
Black	-.133***	-.028**	-.014	-.009	.027
Math Test Score (centered) (Spring)		.667***	.453***	.451***	.451***
Math Test Score (centered and squared) (Spring)		-.243***	-.183***	-.182***	-.181***
Teacher Reports of Social & Behavioral Skills (centered)			.075***	.067***	.052***
Teacher Perceptions of Math (Fall)			.427***	.420***	.425***
<i>Student Characteristics</i>					
Female				.019**	.019**
Home Language-English				.003	.003
SES				.032***	.032***
Two Parent Family				.012	.012
Number of Siblings				-.012	-.010
<i>Timing</i>					
Student Repeat Kindergarten				-.018**	-.019**
All Day Kindergarten				.593*	.609*
<i>Interactions</i>					
Black* Teacher Reports of Social & Behavioral Skills					.034***
Black* Teacher Fall Perceptions of Math Ability					-.031

Note. $N = 10,112$; $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$; results are unweighted; coefficients are standardized.

Table A2. Predicting Spring Teacher Rating of Student Literacy & Language Ability

DV: Teacher Rating of Student Literacy & Language Ability

	Model 1	Model 2	Model 3	Model 4	Model 5
Black	-.139***	-.041***	-.021*	-.018	.022
Reading Test Score (centered) (Spring)		.944***	.629***	.621***	.621***
Reading Test Score (centered and squared) (Spring)		-.413***	-.293***	-.289***	-.290***
Teacher Reports of Social & Behavioral Skills (centered) (Fall)			.069***	.060***	.057***

Teacher Perceptions of Literacy & Language (Fall)	.418***	.416***	.422***
<i>Student Characteristics</i>			
Female		.020***	.020***
Home Language-English		.002	.002
SES		.032***	.032***
Two Parent Family		.004	.005
Number of Siblings		-.0003	-.0005
<i>Timing</i>			
Student Repeat Kindergarten		-.028***	-.028***
All Day Kindergarten		.401	.406
<i>Interactions</i>			
Black* Teacher Reports of Social & Behavioral Skills			.007
Black*Teacher Fall Perceptions of Literacy & Language Ability			-.040
<i>Note.</i> $N = 10,213$; $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$; results are unweighted; coefficients are standardized.			

Notes

1. Data were extracted from the ECLS-K K5th Longitudinal data-Public Release, which was the most current data release at the time of the study.
2. In comparing the final analytic sample to the sample before restriction on academic ability, teacher ratings of academic ability, and SES, the restricted sample had slightly higher values on academic ability, teacher ratings of academic ability, and SES. The final sample is somewhat more advantaged than the sample as a whole.
3. Students who repeated kindergarten are included in the analyses because there is information about them. However, that information does not include the teacher that the student had their prior year. Therefore, we are unable to know if the teachers who are rating repeat kindergarten students in the data are the same teachers that the students had the year prior.
4. The Lowess smoothing graph suggested that it was appropriate to include a quadratic term in both the Mathematical Thinking and the Literacy and Language models.
5. The Appendix tables include standardized coefficients for both the Mathematical Thinking and Literacy and Language tables to allow the reader to examine the magnitudes of the various coefficients in the models.
6. The interaction between race and teacher perceptions of student social and behavioral skills is sensitive to the timing of the outcome variable. When predicting spring teacher perceptions of math ability, there is a positive significant relationship; however, when predicting fall teacher perceptions of math ability the interaction is in the same direction but not significant. The opposite is the case for teacher perceptions of student literacy and language ability. When predicting spring rating, the interaction is not significant, but it is significant in fall. This may suggest that teachers form their perceptions of students ability differently in the fall and the spring.
7. The goal of this paper is to make comparisons between black and white students. Therefore, each student should count equally. Moreover, Winship and Radbill (1994) do not recommend using weights when making such comparisons.

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