

BLACK-WHITE DIFFERENCE IN PERFORMANCE DISCOUNTING:  
ACADEMIC SELF-CONCEPT AND ACHIEVEMENT  
AND STUDENT-TEACHER RACIAL MISMATCH IN THE CLASSROOM IN  
U.S. ELEMENTARY AND MIDDLE SCHOOLS

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## ABSTRACT

In comparison to white students, African-American students typically display relatively high academic self-concept despite having relatively low achievement. The literature suggests that one reason for this phenomenon is black students' tendency to discount objective performance measures (e.g., grades and test scores) when constructing their academic self-beliefs. This dissertation asks why black students are more prone to discounting performance measures when self-evaluating their own academic abilities. Guided by the sociology literature on racial mismatch, and the social psychology literature on performance discounting, this thesis argues that black students' tendency to discount performance measures is structurally patterned in terms of racial mismatch between teachers and students. The literature on racial mismatch has seldom considered its impacts on the discounting process, while the literature on discounting processes has given little evidence of how these theories apply in real school and classroom settings. This dissertation addresses these two shortcomings. There is also relatively little knowledge about how racial mismatch effects vary across different school environments and across different measures of performance. This study tests how discounting processes are moderated by broad school contexts, and conducts separate analyses for test scores, teacher ratings, and parental ratings. Finally, racial disparity in performance discounting has almost exclusively been described in terms of between-person associations based on an external frame of reference (e.g., peer comparisons, etc.), and little is known about the disparity in terms of within-person evolution based on an internal frame of reference (i.e., comparison to one's own prior test scores). Furthermore, there is little knowledge of how racial disparity in performance discounting may grow or decline over the course of

childhood. This study explores the discounting process from a developmental perspective. It uses three waves of data from a national survey, the Early Childhood Longitudinal Study (ECLS-K).

This dissertation found that the performance discounting is significantly greater for blacks than for whites, across broad school context and achievement ratings. This racial difference, however is not explained by racial mismatching of students and teachers uniformly for all schools. The results suggest that the effects of racial mismatch may be moderated by the school's racial composition. In all other school settings, racial mismatch had no relationships to the racial disparity in performance discounting. The study also found that performance discounting weakens over time, but that the racial disparity remains similar throughout schooling. This developmental trend is not explained by racial mismatch. Finally, the study found that, though performance discounting is greater for blacks than for whites at any point in time, blacks' academic self-concepts respond to changes in their own performance just as strongly as do whites'. Implications for relevant issues and policy are discussed.

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# CHAPTER 1

## INTRODUCTION

### *Statement of the Problem*

Researchers have long been puzzled about the *high* self-concept-*low* achievement paradox of blacks (e.g., Hare 1980; Lay & Wakstein 1985; Mickelson 1990). In comparison to whites, blacks typically display higher average academic self-concept despite lower average performance (Graham 1994; Cooper & Dorr 1995). One reason for this phenomenon, the literature suggests, is black students' tendency to *discount* (or disregard) objective performance measures (e.g., grades and test scores) in constructing their academic self-beliefs (Morgan & Mehta 2004; Cohen & Steele 2002). Such discounting, however, has been suggested to come at a cost. It is claimed that those who discount grades and test scores—which often work as “carrots and sticks” for guiding students—may lack the accurate self-assessment (e.g., of their academic strengths *and* weaknesses) that is critical for achievement (Robins & Beer 2001; Aronson & Inzlicht 2004; Pintrich & Zusho 2002; Alexander, Entwisle, & Bedinger 1994; Entwisle & Hayduk 1978). Moreover, recent studies on “optimal self-esteem” increasingly bolster this view, as they conceive optimal self-esteem to be not just “high self-esteem” but based on realistic or accurate self-appraisal (cf. Crocker 2006; Crocker & Park 2004; Harter 2012). Performance discounting poses a challenge for blacks' academic achievement.

Although many researchers have investigated the process of academic self-concept formation (Harter 2012; Stipek & MacIver 1989; Blumenfeld, Pintrich, Meece, & Wessel 1982), relatively few have examined the racial disparities in this process

(Valentine, Dubois, & Cooper 2004: 126; Wigfield & Eccles 2002: 100). Much of the current knowledge on this matter has come from the social psychology literature (e.g., Crocker & Major 1989; Steele & Aronson 1995), and is based on laboratory experiments conducted under contrived settings with non-random samples. Little is known, however, about how such a process may apply in real school and classroom contexts. For example, what is the influence of schools in the racial disparity in academic self-concept? Does the organizational structure of classrooms (in particular, racial mismatch between teachers and students) condition blacks to disregard performance feedback? How does teacher-student racial mismatch affect blacks' academic self-concepts in different types of schools (e.g., segregated vs. integrated schools)? The topic invites the application of current psychological theories to be situated within the broader institutional environment of schools and to a wider range of population for their generalizability.

### *Purpose of the Study*

The primary objective of this investigation is to describe and explain racial disparities in performance discounting for elementary and middle school students in the United States. Analyses are based on data from a large national survey, the Early Childhood Longitudinal Study (ECLS-K). This study focuses on quantifying and explaining the extent to which blacks and whites differentially discount performances in forming academic self-concepts. Specifically, the study examines the influence of *racial mismatch* between teachers and students, including how this influence is moderated by a broader set of school characteristics (e.g., race/SES composition, school climate).

Furthermore, the study compares the results across three different achievement assessments: standardized test scores, teacher's ratings, and parental ratings.

The basic premise of this thesis is that the process of academic self-concept formation is structurally patterned in terms of the racial mismatch between teachers and students. The rationale for this premise is mainly based on two distinct sets of literature: 1) the claim from social psychology literature that people who perceive negative stereotyping tend to attribute unfavorable outcomes to prejudice and discrimination (Crocker & Major 1989); and 2) the claim from sociology literature that teachers evaluate students differentially based on the teacher-student racial mismatch: namely, white teachers evaluate black students more negatively than white students (e.g., their academic potential and behavior) because white teachers are more susceptible to race-based ability stereotype against blacks (Downey & Prebish 2002; McGrady & Reynolds 2013). The argument is that blacks in white-teacher classrooms are structurally conditioned to perceive more negative stereotyping and thus experience ambiguity in assessing the causes of their negative academic outcomes (i.e., *attributional ambiguity*) which, in turn, leads them to be more likely to discount performance feedback. At the same time, guided by the sociology literature on school composition and climate, this structural patterning is expected to vary across broader school context. The derived hypotheses are empirically testable using ECLS-K.

### *Significance of the Study*

This dissertation differs in many ways from earlier studies and makes several contributions to the existing literature.

1. This dissertation bring together two separate literatures. On the one hand, the sociology literature on teacher-student racial mismatch has considered its potential impact on students' mean academic self-concept, but seldom has considered its impact on academic self-concept's relationship to achievement. On the other hand, the social psychology literature on discounting processes has given little evidence of how these theories apply in real school and classroom settings. This dissertation addresses these two shortcomings.

2. The literature on the discounting process has focused on university students, and little evidence exists for students of elementary and middle schools. However, it is well established that the development of self-concept in middle childhood critically sets the stage for adolescence, wherein self-concept becomes more solidified and resistant to modification (Demo 1992). Recent studies also suggest that children as young as 10 years old (3<sup>rd</sup> grade) are susceptible to stereotype threats (McKeown & Strambler 2009), which claim to anchor the discounting process. This study investigates the mechanism of performance discounting based on stereotyping in primary school students.

3. There is relatively little knowledge about how racial mismatch effects vary across different school environments. This study tests the moderating influences of school characteristics on racial mismatch effects on academic self-concepts. Specifically, the study considers the moderating influences of a school's 1) racial composition, 2) socioeconomic status (SES) composition, and 3) school climate.

4. Studies on race disparity in academic self-concept have typically used either test scores or report card grades as the only standard by which to assess whether students' academic self-concepts are discounted or not (e.g., Morgan & Mehta 2004; Graham

1994). However, it is well established that students also form their academic self-concepts based on reflected appraisals by significant others (Shavelson, Hubner, & Stanton 1976). For comparison purposes, this dissertation incorporates three different measurements of achievement: 1) standardized test scores, 2) teachers' perceptions of students' abilities, and 3) parental perceptions of students' abilities.

5. Racial disparity in performance discounting has almost exclusively been described in terms of the between-person associations based on an external frame of reference (e.g., peer comparisons, etc.). Little is known about the disparity in terms of the within-person evolution based on an internal frame of reference (i.e., comparison to one's own prior test scores). More importantly, there is very little knowledge of how racial disparity in performance discounting may grow/decline developmentally over the course of childhood. This dissertation takes advantage of the panel design of the ECLS-K to supplement the existing cross-sectional analyses with an exploration of racial disparity in performance discounting from a developmental perspective.

This study expects the process of academic self-concept formation to be structurally patterned, in particular according to the racial matching of teachers and students in classrooms. For blacks, the perception of negative stereotype in white-teacher classrooms interferes with the accurate self-assessment of their academic competence, resulting in a dissociation between academic self-concept and achievement. This is a problematic proposition for black students in primary schools, because some 70—90% of them at any time are taught by non-black teachers (Bates & Glick 2013). Nonetheless, this dissertation cautions against oversimplifying an interpretation of such structural patterning. African-American teachers are typically found in predominantly black schools

in poor urban districts, and the ways that teachers perceive students of various races can vary across broad contextual frames. Likewise, the ways that students process their teachers' (mis)perceptions of their academic potential can differ across school types. This dissertation will show a structural pattern in the relationship between academic self-concept and achievement, as well as its complexity in relation to broader contextual influences.

## CHAPTER 2

### LITERATURE REVIEW

#### BACKGROUND

##### *What is Academic Self-Concept?*

This study adopts the framework of self-concept as generally laid out by Shavelson, Hubner, and Stanton (1976). Self-concept is broadly defined as the hierarchy of a person's perception of himself (p. 411), with "general self-concept" at the top, and more situation-specific self-concepts below (e.g., academic self-concept, physical self-concept, etc.; p. 412). Self-concepts are presumed to be more stable at the top of the hierarchy (i.e., general self-concept) and increasingly malleable as they become situation-specific; thus, subject-specific academic self-concepts (e.g., math/verbal academic self-concepts) are more malleable than overall academic self-concepts, which are, in turn, more malleable than general self-concepts (p. 414). Academic self-concepts describe a person in an academic situation (e.g., "I learn things quickly in math", "Work in math is easy for me"), but they also evaluate the person (e.g., "I am good at math"). Evaluations are generally made against three standards: 1) an absolute standard (e.g., aptitude scores), 2) a relative standard (e.g., comparison to peers), and/or 3) the standards of significant others (e.g., parent and teacher perceptions of a child's academic ability; p. 414). The distinction between self-description and self-evaluation is presumed equivocal, and thus the term "self-concept" and "self-esteem" are used interchangeably (p. 415). Studies show that academic achievements are positively associated with academic self-concept but not necessarily with general self-concept (Rosenberg et al. 1995; Hattie 1992). It is established that the antecedents and consequences of academic self-concept are distinct

from those of general self-esteem, and each concept requires a related but distinct theoretical framework (Wylie 1979).

Shavelson and his colleagues' framework of academic self-concept has been widely adopted in the educational literature (e.g., Marsh, Byrne, and Shavelson 1988), but it is not the only available one. Depending on the particular framework one uses, a construct similar to academic self-concept can be conceived of as “perceived competence” (e.g., Harter 1999), “ability belief” (e.g., Eccles & Wigfield 2002), or “academic self-esteem or image” (e.g., Entwisle, Alexander, Pallas, & Cadigan 1987), among others. There is no universally-agreed definition that brings together these different constructs (e.g., see Bong & Skaalvik 2003 for a review). This dissertation acknowledges such limitations while proceeding to use these terms interchangeably, based on the assumption that all these constructs represent conceptually the following essential characteristic: academic self-concept refers to an individual's perception of their own academic competence based on the self-evaluation of their academic situation.

The importance of academic self-concept has been well documented within an achievement-motivation framework. For example, in expectancy-value theory (Eccles et al. 1983; Wigfield & Eccles 2000), academic self-concept is viewed as an immediate antecedent to the expectancy of success and task value, which entails achievement-related behaviors that lead to higher performances. Other theories argue their importance in different terms—e.g., self-determination (Deci & Ryan 2010), self-worth (Covington 1992), perceived intelligence (Dweck & Leggett 1988), and others. Also, in sociology's status-attainment model (Sewell, Haller, & Ohlendorf 1970), it is implicit that academic self-concept mediates the influence of academic performance on educational aspirations.

Although high academic self-concept has typically been considered desirable (Eccles et al. 1983; Harter 1999), recent studies suggest that realistic or accurate self-appraisals might be just as important. Studies on self-regulated learning (Zimmerman & Risemberg 1997; Pintrich & Zusho 2002; Pintrich, Wolters, & Baster 2000), for example, have established the importance of well-calibrated self-assessment in setting effective goals and implementing corrective actions for achievement. Grades and test scores are presumed to be “carrots and sticks” that guide students to make improvements as needed. When students fail to respond to feedback from teachers and discount their own performances, they are likely to be at risk of poor self-regulated behaviors, including poor preparation and lesser inclination to seek help (Zimmerman 1990; Borkowski & Thorpe 1994; Zimmerman & Risemberg 1997). Similarly, empirical studies on Caucasian subjects support the view that the benefits of academic self-concept on subsequent achievements are contingent upon the former being based on strong associations with prior achievements (i.e., reciprocal effect models; Marsh et al. 2005). Studies suggest that both overestimation (Chiu & Klassen 2010; Vancouver & Kendall 2006) as well as underestimation of perceived academic competence (Phillips 1984; 1987; Phillips & Zimmerman 1990) can be deleterious to achievements.

### *Issues in Conceptualizing Discounting*

Measuring the extent to which academic self-concepts are realistically based on achievements can be problematic in the absence of objective standards. How can people distinguish if one person is discounting achievements more or less than others?

Studies typically use mean-level analyses (e.g., ANOVA or cross-tab) to infer discounting. This method may be reasonable for analyzing a homogenous population, but when analyzing two distinct subpopulations with distinct means for each distribution, the method systematically requires one population to be always overestimating its competence while the other is always underestimating. This dissertation, instead, adopts the relational perspective (e.g., see Alexander, Entwisle & Bedinger 1994; Morgan & Mehta 2004). In this perspective, the association between academic self-concept and achievement should indicate performance discounting. The more students discount their achievements, the weaker should be its association with academic self-concept. Empirically, discounting is represented by the correlation or slope in regression of academic self-concept and achievement (e.g., see Morgan & Mehta 2004).

#### *Race Disparity in Academic Self-Concepts*

Most of the empirical studies that describe a racial disparity in academic self-concept have been based on comparisons of means (e.g., Rosenberg & Simmons 1972; Hare 1980; Lay & Wakstein 1985; Marsh 1987; Stevenson, Chan, & Uttal 1990; Graham 1994 for a review). These studies have generally found that blacks, on average, have a higher or equal level of academic self-concept as whites for a given level of performance. Although these mean-level studies strongly suggest that blacks' self-concepts are less associated with performance than whites', they do not necessarily demonstrate it. However, the few studies that have conducted correlation/regression analyses do offer some evidence that blacks, in fact, have significantly weaker associations between academic self-concept and achievement (Morgan & Mehta 2004; Kurtz-Costes, Ehrlich,

McCall, & Loridant 1995). Morgan and Mehta's study (2004), based on a nationally-representative sample of high school students in the U.S. (NELS), provides the most up-to-date and comprehensive description this issue.

Morgan and Mehta (2004) found that, for 10<sup>th</sup> graders in U.S. high schools, black students' academic self-concepts were significantly less associated with academic performance than whites'. Using the well-established self-descriptive questionnaire (SDQ), which measures academic self-concept according to indicators (e.g., "I am good at math," "English is one of my best subjects," "I have always done well in math," "I am hopeless in English classes," etc.), they regressed indicators on standardized test scores and race, as well as on the interaction of race and test scores, while controlling for family background factors and tracking record. As expected, they found strong relationships between students' actual and perceived performances, but they also observed that these relationships were some 40% weaker for black students. As they also found that blacks' misperception of their academic abilities was more likely due to overestimation, they concluded, "we interpret this weaker relationship by blacks a sign that black students discount performance evaluations more than do their white peers" (p. 95). They added, "we cannot say exactly why this is so from our survey data" (p. 95).

This dissertation takes up where Morgan and Mehta left off. The study examines the reasons why black students discount performance evaluations more than their white peers. It also extends their analysis to include elementary and middle school students. For comparative purposes, this study closely follows the analytical framework of Morgan and Mehta (2004) when possible, but deviates significantly in the treatment of school-level characteristics. Instead of just controlling for school-level characteristics, as Morgan and

Mehta did, this study examines how school contexts moderate the influence of student-teacher racial mismatch. Furthermore, where Morgan and Mehta limited their analyses to cross-section of the sample at tenth grade, this study supplements cross-sectional analyses with panel data analysis to examine the distinct developmental patterns of performance discounting in blacks and whites.

## PROCESS OF ACADEMIC SELF-CONCEPT FORMATION

Why are blacks' academic self-concepts less associated with their performance? Below, the discussion begins with a review of the theories concerning development of academic self-concept for all children, both blacks and whites; special attention is paid to the developmental progression of academic self-concepts across different stages of schooling. Then, the discussion extends to the theories about why there might be black-white differences in the formation of academic self-concept, including performance discounting mechanisms. Finally, the sociology literature on racial mismatch and school context are discussed as it pertains to structural patterns in performance discounting.

### *Development of Academic Self-Concept: All Children*

*Lower- and middle-elementary school stage.* The literature on individual variation in academic self-concept generally discusses these variations within a developmental context. These accounts are thoroughly reviewed in Stipek and MacIver (1989), which is summarized below.

First, it is well-established that young children (7 or 8 years old, 1<sup>st</sup> or 2<sup>nd</sup> grades) tend to possess overly optimistic academic self-concepts, which gradually declines across

age and stages of schooling (Stipek & MacIver 1989). Researchers argue that young children's highly optimistic academic self-concepts are often results of *cognitive immaturity*. The younger you are, the less you are able to differentiate various domains of competence (e.g., athletic vs. academic), to differentiate ability from effort, to take into account the difficulty of tasks, and to understand the symbolic meaning of grades, than can older children (Stipek & MacIver 1989). Studies also point to easier classroom learning contexts in the early stages of schooling (e.g., 1<sup>st</sup> and 2<sup>nd</sup> grades) as a factor behind overly optimistic self-concepts for the young (Blumenfeld, Pintrich, Meece, & Wessel 1982). In addition, young children's greater tendency to believe in ability as an incremental entity (a belief that ability is malleable and can be developed (e.g., Dweck & Legget 1988)) rather than being fixed, is said to factor into their higher academic self-concepts (Stipek & MacIver 1989). Studies show that young children rely more on "wishful thinking" and have a tendency to not use any comparative standards to assess their abilities; but, as they grow older, they begin to compare themselves to others, and their self-assessment becomes more critical. Eccles et al. (1983) found that children show precipitous declines in academic self-concept from the 6<sup>th</sup> to 7<sup>th</sup> grades, while Simmons and his colleagues (1979) found a sharp decline at 7<sup>th</sup> grade.

*Upper-elementary and middle school.* Studies show that as children grow and advance into upper elementary schools, their academic self-concepts not only decline but also become more reflective of academic achievements (Stipek & MacIver 1989; Harter 1999). Not only do older children better differentiate between various domains of competency (e.g., physical vs. academic) but the emphasis of schooling becomes increasingly more intellectually based (Stipek & MacIver 1989: 532). No longer do

students receive good grades merely on “good conduct,” but now they are judged by performances in tests and assignments according to objective criteria (Stipek & MacIver 1989). Teacher-student relationships become less personal, and positive feedback more difficult to attain. Also, the sheer volume of performance evaluations increases, giving students more chances to assess themselves realistically (Stipek & MacIver 1989).

Studies also show that in about 3<sup>rd</sup> grade, children begin to employ *social comparison* substantially when evaluating their academic abilities (Aboud 1985). They become more skilled at obtaining information about others (e.g., exchanging report cards) and interpreting their own academic competence in relation to others (Stipek & MacIver 1989). Research shows that children employ strategies to more critically evaluate their academic abilities by being selective with whom they compare themselves, as well as by broadening the evaluation norm. For example, Sul and Sanders (1982) found that 5<sup>th</sup> and 6<sup>th</sup> grade children (compared with 1<sup>st</sup> graders) were more inclined to compare themselves with those who had similar, non-ability related, individual characteristics. At the same time, Feldauer et al. (1988) found that students in middle school (vs. elementary school) were more likely to formulate their academic self-concepts based on a broader evaluative context such as with standardized test scores or a national scholarship competition that scored their abilities relative to a national norm.

*Different evaluative criteria.* Typically, standardized test scores and/or teacher-assigned grades are used as the index of achievement in studies analyzing the relationship between academic self-concept and achievement. However, it is well established that academic self-concepts are also based on reflected appraisals from significant others, especially parents (Shavelson, Hubner, & Stanton 1976). The theories of the “looking

glass” (Cooley 1902) and “self” (Mead 1934) posit that people form ideas about themselves based on their beliefs about how others perceive them. Accordingly, academic self-concept is expected to vary among children with equivalent test scores and grades, depending on variations in parental beliefs about their children’s abilities and the extent to which children evaluate themselves based on such beliefs. In the same way, since teacher-assigned grades are based on teachers’ subjective perceptions of students, which may be different to their actual level of proficiency (as indicated by standardized test scores), academic self-concept is expected to vary among students with equivalent test scores and parental beliefs but with different assessments by teachers. The following is a brief discussion of teacher and parental ratings and how these measures may differ from test scores, presumably objective measures of achievement.

*1. Teacher ratings.* Researchers generally posit that teacher feedback is more immediate, salient, and easier to compare than standardized test scores, and thus has a stronger impact on self-concept (e.g., Wylie 1979). Empirical studies have found a correlation of academic self-concept with both test scores and teacher-assigned grades (e.g., Marsh et al. 2005; Valentine, Dubois, & Cooper 2002) but a *stronger* correlation with teacher-assigned grades (Wylie 1979; Hansford & Hattie 1982; Marsh et al. 2005).

Teachers’ ratings of students are typically normally-distributed; that is, teachers tend to grade students in relation to the average abilities of the classroom. Thus, a student might score high on a standardized test but still receive only average performance feedback if the rest of his classmates are equally able. Hence, controlling for one’s own

academic achievement, teachers' appraisals of students tend to be more negative when the average ability of the classroom is relatively high (Davis 1966; Marsh 1987).

Although studies generally show that teachers' perceptions of students' competencies are accurate—i.e., correlate strongly with test scores (e.g., Brophy & Good 1974), studies also document “self-fulfilling prophecy” in which teachers' expectations are realized through various mechanisms based on teachers' initial perceptions of students (e.g., Rosenthal & Jacobson 1968; Brophy & Good 1974). These effects, if true, are especially troublesome for blacks, because studies consistently show that teachers have more negative perceptions and expectations of black students than white ones (e.g., see Ferguson 2003 for a review).

*2. Parental beliefs.* Empirical studies find that parental beliefs affect students' academic self-concepts, even after controlling for their child's achievements (Eccles 1993; Jacob & Eccles 1992; Parsons et al 1982). In terms of variation, studies found that black parents (vs. whites) tend to hold more optimistic views of their children's educational outlook, including higher educational aspirations and expectations of achievement (e.g., Hochschild 1995; Wentzel 1998); however, some studies suggest that such optimism may be largely based on parents discounting their children's achievements—e.g., by inaccurate recall of report card marks (Alexander, Entwisle, & Bedinger 1994). Interestingly, studies on Asian and immigrant parents find that Asian parents also hold more optimistic views about their children's educational outlook than do white parents (e.g., Hao & Bonestead-Brun 1998; Kao & Tienda 2003), but their optimism tends not to produce the same positive impact on children's self-concept as does black parents'. In

fact, Asian children often report the lowest self-concepts of all racial-ethnic groups (Twenge & Crocker 2002).

The remaining discussion of the literature, below, evolves around the use of test scores/grades as the index of achievement. Meanwhile, the issues related to the varying consequences of using three evaluative criteria are kept in mind and will be explored more fully in the theoretical framework and analytical strategy sections.

#### *Variation in Formation of Academic Self-Concepts: Black vs. White*

Knowledge of how the formation processes of academic self-concept vary across races is insufficient (Eccles & Wigfield 2002). It is unclear, for example, whether blacks are more or less capable with respect to differentiating different domains of competence, differentiating ability from effort, or understanding the symbolic meaning of report cards, etc. Such capacities, as they relate to basic cognitive abilities, may be socially and racially patterned, but the evidence is clear that a black-white disparity in academic self-concept occurs across all cognitive levels and across all stages of schooling, even when the capacity to critically self-evaluate is more fully developed (e.g., Graham 1994).

The issue at hand, then, is not the cognitive ability or capacity to accurately self-appraise—nor some type of response bias (e.g., Bachman & O'Malley 1986), arguments of which have been strongly refuted (e.g., Downey 2008)—but rather the different strategies or ways of responding to academic outcomes in different social contexts that are employed by blacks and whites. The following section provides a review of the psychological strategies that potentially entail racial disparity in the formation of academic self-concept. The premise in discussing these theories is that blacks are distinct

from whites in their need to cope with perceived prejudice (stigmatization) against them in academic situations.

### *Psychological Strategies*

There are three prevailing theories on how the socially stigmatized (e.g., mentally ill, handicapped, women, blacks, etc.) formulate their self-concepts when perceiving stigmatization: 1) performance discounting/selective attribution, 2) in-group social comparison, and 3) disidentification/selective devaluation (e.g., see Crocker & Major 1989 for a thorough review). Below are the brief explanations of each, with a focus on the performance discounting theory. The performance discounting theory underpins the theoretical framework of this dissertation. An important thing to note is that these three theories is distinct, and that even though their applications may overlap, each is independent of the others.

*1. Performance discounting/selective attribution.* This theory posits that people who are stigmatized (e.g., mentally ill, handicapped, women, blacks) protect their self-esteem by attributing negative outcomes to prejudice against their group (Crocker & Major 1989). People protect their self-esteem by discounting negative performance and feedback as a consequence of prejudice. This theory is consistent with Weiner's (1984) attribution bias theory, which posits that external attribution for failure can buffer one's self-esteem while internal attribution can damage it. Thus, for example, an experimental study found that college women who received poor feedback for their essays showed higher self-esteem when told that their evaluators were gender-biased against women than when told their

evaluators were unbiased (Testa, Crocker, & Major 1988). Similarly, in another experiment, black college students showed higher self-esteem in response to negative feedback when they knew that their faces were being shown to a white evaluator than when they didn't (Crocker, Voelkl, Testa, & Major 1991).

In line with these findings, recent studies on *stereotype vulnerability* show that blacks who have a tendency to perceive and expect racial prejudice against them are more likely to employ the performance discounting strategy (Cohen & Steele 2002; Aronson & Inzlicht 2004; Aronson & Steele 2005). However, unlike prior studies that focused on the protective aspect of the strategy (in terms of self-esteem), recent studies have highlighted its more negative aspect in terms of the inaccuracy of self-knowledge (Aronson & Inzlicht 2004; Inzlicht & Good 2006). For example, Aronson and Inzlicht's experiment with college students found that blacks who were stereotype-vulnerable (as measured by a questionnaire) were more likely to overestimate their own test scores than blacks who were not stereotype-vulnerable, across all performance levels. Similarly, in another experiment with college undergraduates, Schmader and his colleagues (2001) measured the students' beliefs regarding broad social injustice, injustice against one's particular race-ethnic group, and perceived test bias (e.g., "I feel that standardized achievement tests are definitely biased against me"), and found that those students who had greater perceptions of ethnic injustice against their group were much more likely to say that standardized tests were biased against them. The experiment, however, did not find that poor performances were related to a perception of testing bias in blacks, although they did for whites. This finding suggests that, under stereotype conditions, blacks are less

likely to take achievement or performance feedback as true indicators of their academic ability.

Less discussed in these studies (but assumed) is that the discounting strategy may be employed if, and only if, a person is aware of the broadly-held stereotypes against their group (i.e., stereotype consciousness). Without stereotype consciousness, a person is said to be unable to interpret events and situations in terms of prejudices and biases (Brow & Bigler 2005). This requires that a person is of adequate age to have acquired such consciousness. For example, studies found that very young children (e.g., 6 years old) are not stereotype-vulnerable (McKown & Weinstein 2003). Perhaps for this reason, there are almost no empirical studies on stereotype threats using primary school students. However, a recent study showed that children as young as 10 years old (3<sup>rd</sup> grade) can begin to infer other people's stereotypes. McKown and Strambler (2009) wrote, "by late elementary school, most children have developed sufficient knowledge of broadly held stereotypes that they may regularly interpret social interactions as expressions of discriminations" (p. 1655), and "it is in middle to late elementary school that children become susceptible to stereotype threat conditions" (p. 1656). It should then be expected that even children as young as 3<sup>rd</sup> graders can begin adopting a performance discounting strategy in forming their academic self-concepts. In terms of the determinants of stereotype consciousness, researchers attribute 1) direct and indirect exposure to racial prejudice and discrimination, and 2) socialization of racial identity at home, typically by parents (e.g., teaching ethnic pride, warning about racial bias, etc.; Hughes & Chen 1999).

2. *In-group social comparison.* The in-group social comparison theory claims that stigmatized people protect their self-esteem by comparing themselves to members of their own stigmatized group (Crocker & Major 1989). Such comparisons are said to occur through both physical proximity and active-seeking. Thus, black students are more likely to compare themselves to other blacks when they attend predominantly black schools (physical proximity), yet a woman working in a predominantly-male company may still compare her salary with those of other women in the industry rather with those of other men in her company (active-seeking).

Empirical evidence of in-group social comparisons is numerous. For example, Harter (1986) found that learning-disabled children had lower perceived competence than did mentally retarded children because the learning-disabled children were more likely to have grown up with “normal” children and have the frame of reference of “normal” children. In contrast, mentally retarded children who grew up with children like themselves did not have the frame of reference of “normal” children. Likewise, Coleman and Fults (1982) showed that gifted children’s self-esteem declines sharply when they are put in a classroom with other gifted children, but it returns to high levels when they are put back in a regular classroom. Similarly, studies on school composition consistently find that black students’ self-esteem and other psychosocial outcomes are positively affected by increases in the percentage of minorities and/or decreases in the average SES of schools (Rosenberg and Simmons 1972; Johnson, Crosnoe, & Elders 2001; Goldsmith 2004; Crosnoe 2009).

3. *Disidentification/selective devaluation*. This theory posits that stigmatized people protect their self-esteem by devaluing the individual domain of self-esteem in which they are being stigmatized (Crocker & Major 1989). The theory has been taken up by Steele (1992; 1997) in his formulation of the *disidentification* theory, which argues that the chronic experience of stereotype threats, anxieties, and underperformance lead a person to disidentify himself from the stigmatized domain all together (e.g., “I am not a school person”). This process is claimed to be highly detrimental, as people no longer become interested in doing well in the tasks within the disidentified domain. There is, however, a conceptual and empirical distinction between “discounting” and “disidentifying,” as those who discount are still very much invested in the particular domain of interest (i.e., empirically showing motivation), whereas those who disidentify do not care about performances in the domain anymore (Steele 1997). Discounting is presumed short-lived, while disidentification is more permanent. Chronic discounting can eventually lead to disidentification (Steele 1997).

Steele argued that blacks often disidentify themselves from the domain of academics (Steele 1992; 1997; Steele & Aronson 1995). This theory also runs parallel with Ogbu’s *oppositional culture* theory, which posits that blacks also devalue academics due to subcultural norms and peer pressures associated with being an involuntary minority (Ogbu 2004; Fordham & Ogbu 1986). The empirical support for the disidentification theory has been relatively scarce, except for ethnographic studies devoted to oppositional culture theories (e.g., see Major et al 1998; Osborne 1995 for exception). On the other hand, several large-sample studies have recently presented evidence that challenges the disidentification theory and showed that blacks are just as

invested in academics as are whites (Ainsworth-Darnell & Downey 1998; Johnson, Crosnoe, & Elder 2001; Downey & Ainsworth-Darnell 2002; Morgan & Mehta 2004; Downey 2008).

These three strategies (performance discounting, in-group comparison, disidentification), then, constitute the core of the psychological mechanism behind the racial disparities that are present in the formation of academic self-concept. Next is a discussion of the structural influences of classrooms and schools as they pertain to one particular component of this mechanism—the performance discounting strategy.

### *Classrooms and Schools*

*Teacher-student racial mismatch.* Empirical studies have found that teachers hold differential perceptions and expectations about students' academic potential and school-behaviors based on children's race (e.g., see Ferguson 2003 for a review). Though there is a strong possibility for confounding influences of SES in these differential teacher beliefs (e.g., Alexander, Entwisle, & Thompson 1987; Brophy & Good 1974), recent studies have focused their attention on racial incongruity between teachers and students. These studies have consistently shown that teachers perceive black students (vs. white) more negatively, i.e., less hardworking, less attentive, more disruptive, and less likely to achieve, etc. (McGrady & Reynolds 2013; Bates & Glick 2013; Downey & Pribesh 2004). However, it remains unclear whether these perceptions are biased in the sense of being inconsistent with the "observables" (i.e., actual behavioral traits and/or performance levels; Ferguson 2003). Some studies found that these perceptions are accurate when controlling for students' prior observables (e.g., Jussim, Eccles, & Madon 1996), while

others found that these teacher perceptions were biased above and beyond students' characteristics (e.g., Downey & Pribesh 2004). Nonetheless, all studies generally agree that teachers' perceptions are more negative for blacks than for whites.

Researchers also found that these negative perceptions of black students are not shared by all teachers. The race of the teacher affects how they perceive students of different races ("racial mismatch effects"). Specifically, studies show that white teachers (vs. black teachers) hold more negative perceptions towards black students (vs. whites) but that black teachers generally do not show differences in how they perceive black or white students (McGrady & Reynolds 2013; Bates & Glick 2013; Downey & Pribesh 2004).

A recent batch of evidence suggests that this racial mismatch effect exists across all stages of schooling. Based on a nationally representative sample, Downey and Pribesh (2004), for example, found this mismatch effect in kindergarten and 8<sup>th</sup> grade, Bates and Glick (2013) in 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup> grade, and McGrady and Reynolds (2013) in 10<sup>th</sup> grade high school. In all three studies, white teachers were found to perceive black students as more problematic, disruptive, less effortful and/or less capable of academic achievement, while black teachers perceived no differences in black and white students.

Much of these findings pertain to teachers' perceptions, not their treatments towards students. In fact, some suggest that teachers try to over-compensate their potentially biased views by overpraising and sometimes under-challenging students (e.g., Brophy & Good 1974). But studies consistently find self-fulfilling prophecy effects and that teachers' perceptions matter to students' achievements (Ferguson 2003). Teachers are said to both verbally and non-verbally communicate their biased views through various

manners and styles of communication—e.g., taking longer times to answer questions, giving less challenging tasks, giving more time to certain students to speak up, etc. (e.g., Brophy & Good 1974). It is also suggested that black students (vs. whites) may have greater sensitivity to teachers' perceptions (Ferguson 2003). Cohen and Steele (2002) suggest that minority students who have had a long history of prejudice as a race-ethnic group, such as blacks, have a general sense of mistrust against schools as institutions and “view white teachers with suspicion until they have evidence that [white teachers] are worthy of trust” (Cohen & Steele 2002, p. 305). But *how* these perceived prejudices and mistrusts translate into negative outcomes for students' academic achievement remains unclear. What has been recently suggested is that, beyond the correlated benefits of having white teachers in terms of their qualifications and experience, racial mismatches dampen blacks' achievements (Dee 2005).

*Moderating influences of school composition/climate.* The racial mismatch effects, as discussed above, do not occur in a vacuum, but within a larger school context. How teachers perceive students and how students interpret teachers' perceptions should differ across school compositions and climates. Below is a brief review of the literature on school composition and climate as it pertains to performance discounting vis-à-vis racial mismatch effects.

*1. School composition.* Researchers have long examined the effects of the racial and SES composition of schools on various student outcomes (e.g., Coleman et al. 1966; Brookover et al. 1978; Johnson, Crosnoe, & Elder 2001; Goldsmith 2004), but relatively little is known about how such composition moderates student stereotype vulnerability

and teacher perception in classrooms. From the teachers' side, it has generally been found that white teachers in minority-concentrated schools (vs. white schools) are generally less content, more likely to leave schools, and harbor stronger negative perceptions against black students (e.g., Renzulli, Parrott, & Beattie 2011). One of the theories underpinning these findings comes from Blumer's (1958) "group threat" perspective, which posits that a dominant group—that is, white—seeks to preserve their advantaged position and, in the process, responds to perceived threats from the minority group with prejudice and out-group hostility. Thus, it is argued that an increase in the size of a minority group results in an increase in the dominant group's prejudice and hostility against it (Quillian 1995). Yet, some empirical findings suggest that the boundary between the dominant-group and out-group may not always be clear. For example, Morris (2005), in an ethnographic study, showed that white teachers' treatment of white students in a predominantly black school was just as negatively biased, suggesting that whites may not always be treated as a dominant-group.

From the students' perspective, it has been shown that black students' psychosocial outcomes (e.g., self-esteem, educational aspirations) improve with increases in the percentage of minority students in their schools. According to the *token status* theory (e.g., Kanter 1977), a person feels more aware of his/her stigmatized condition (e.g., being black) when he is surrounded by more non-stigmatized people. This suggests that blacks in predominantly black schools may feel less stereotype vulnerable than blacks in predominantly white schools, and thus less likely to discount their own performance. However, the literature has largely attributed blacks' enhanced self-concepts in predominantly black schools to in-group social comparison (or "frog pond")

effect; e.g., Davis 1966; Marsh 1987) or, in fewer cases, to disidentification. Little has been discussed in terms of performance discounting strategy.

In terms of the SES composition of schools, the literature typically has difficulty disentangling racial and SES factors as the two are highly correlated. For example, there are few schools that are both predominantly black and composed of high SES students. It is surmised, though, that racial bias exists above and beyond class bias (Massey & Denton 1993) and, thus, one could reasonably expect the influence of racial mismatching on perceived stereotypes to vary across schools with different compositions of SESs. Thus, for example, Rumberger and Palardy (2005) find teachers' expectations of students' learning ability to be lower in schools with a low average SES (vs. high), while Crosnoe (2009) found black students' self-images to be higher in low SES schools. Studies also found that the negative effects of low-SES composition on teachers and students are magnified when the school has a high percentage of minorities (e.g., Crosnoe 2009).

2. *School climate*. School climate refers to perceptions held by students and teachers about the schools' norms and expectations, including its policies and motivations, as well as the attitudes and behaviors of its participants (Brookover et al. 1978; Boge, Smit, & Hanson 1990). In the school climate literature, *academic climate* is synonymous with *academic press* (e.g., Lee & Smith 1999), which refers to the organizational norms for "academic excellence and conformity to specified academic standards" (p. 912). Schools with high academic climate are said to push students hard for high grades, reward excellent performance, and channel students into a rigorous curriculum (rather than "watered-down" courses; Shouse 1996). Some researchers also include disciplinary climate as a part of academic climate (e.g., Bodovski et al 2013; Shouse 1996), and show

that schools with high academic climate are typically characterized by strict and effective disciplinary policies aimed at good attendance rates and decorum (Shouse 1996). Though academic climate is generally shown to have positive effects on school achievement (e.g., Lee & Smith 1999; Phillips 1997), its impacts on students' self-concepts and psychosocial outcomes have been mixed. McDill and his colleagues (1986), in their review, warn that high academic press can alienate low-achieving students who cannot keep up with high academic demands. Additionally, evidence shows that schools with strong disciplinary climates are likely to exacerbate minority students' (especially blacks') distrust of schools; studies show that inner-city minority students are more than three times more likely to be suspended than are their suburban white counterparts (e.g., see Haynes, Emmons, & Ben-Avie 1997). Some researchers juxtapose high academic climate against high *communal climate*, the climate in which organizational priorities are set on interpersonal relations and sense of community (Phillips 1997). Studies have shown that schools with high communal climates (e.g., Catholic schools) are especially effective for low SES minority students (Bryk, Lee, & Holland 1993). At the same time, it is also demonstrated that high academic press schools are particularly effective in raising achievement in low SES schools. Survey results show that students are appreciative of the rigorous curriculum in high academic press schools (Haynes, Emmons, & Ben-Avie 1997). In high academic press schools, teachers are likely to hold higher expectations for students than in lower press schools. With regards to school climate and the performance discounting process, it may be that academic climate and disciplinary climate have distinct consequences, with the former inhibiting the process and the latter facilitating it. The literature is unclear on this issue.

## *Summary*

This dissertation began with the question: Why are blacks' academic self-concepts higher than whites' despite their lower levels of achievement? This question led to a more fundamental question regarding the process of self-concept formation: Why are blacks' academic self-concepts less related to achievement than are whites'? The literature gave us three plausible answers. One, blacks are more likely to perceive racial prejudice, which, in turn, leads them to be more likely to disregard or discount performance feedback. Two, blacks are more likely to compare their performance feedback with their black peers, who on average do not do as well as whites. Three, blacks are more likely to be disidentified from schooling altogether and not take into account performance feedback. This dissertation, then, reviewed the literature that discussed how the first of these three answers (i.e., performance discounting) might be structurally patterned by racial mismatching of teachers and students in classrooms. The literature suggested strongly that *ceteris paribus* blacks in white-teacher classrooms will more likely engage in performance discounting than blacks in black-teacher classrooms. The literature on how this structural conditionality of performance discounting may vary across different school contexts, as well as across different indices of achievement, was then discussed.

There are two notable gaps in the literature on performance discounting. One, the theory has seldom been tested in real school and classroom settings. In contrast, the theories on in-group comparison (e.g., the frog pond theory), and to a lesser extent disidentification, have been more widely tested. To this author's knowledge, the performance discounting strategy has never been tested using national survey data. Two,

the theory has rarely been tested for children in primary schools. On the flip side, no studies on racial mismatch effects have yet empirically examined performance discounting as a possible consequence of interest.

Next, the theoretical framework and set of hypotheses aimed at filling these gaps are set out.

## CHAPTER 4

### RESEARCH QUESTIONS AND HYPOTHESES

#### *Theoretical Framework*

As compelling as the argument of performance discounting strategy is, there is little empirical support to generalize such an argument beyond laboratory settings, and, especially to children in elementary and middle schools. The findings on the racial mismatch effect, however, provide an opportunity to construct testable hypotheses for the discounting strategy argument based on observational data of real schools and classrooms. In experimental terms, a racially-mismatched classroom serves as a natural treatment for stereotype vulnerability, while racially-congruent classrooms can serve as controls. The rationale is that *ceteris paribus* blacks are more likely to perceive and experience racial prejudice in white-teacher classrooms than in black-teacher classrooms. In all these tests, the in-group comparison and disidentification strategies are controlled for in order that performance discounting strategy is isolated as the sole process of interest behind self-concept formation. With this setup, this dissertation is then able to explore the contextual influences of school composition and climate in the performance discounting process.

#### *Research Questions*

Specifically, I aim to answer the following six questions:

1. Is there a racial difference in performance discounting?

2. Does the racial difference in performance discounting vary according to the patterns of racial mismatch?
3. Does the relationship between racial mismatch and racial difference in performance discounting vary according to school context (school's racial composition, SES composition, school climate)?
4. Is there racial difference in the developmental path of performance discounting over the six-year period (3<sup>rd</sup> to 8<sup>th</sup> grade)?
5. Does the racial difference in the developmental path of performance discounting vary according to the patterns of racial mismatch?
6. Does the racial difference in performance discounting vary according to the frame of reference for discounting (external frame of reference, internal frame of reference)?

### *Working Hypotheses*

Based on the literature reviewed here, this dissertation tests the following hypotheses to investigate the research questions above:

1. Because blacks (vs. whites) are more likely to perceive negative stereotypes about their academic situations, blacks (vs. whites) are more likely to discount performance and feedback in constructing their academic self-concept. Also, such a discounting process is

expected to be stronger when the feedback is from teachers, from whom they directly perceive prejudice, than from standardized test scores, which are more impersonal and less easy to make selective attribution with. On the other hand, because blacks are not expected to perceive prejudice any more or less from their parents than do whites, blacks' self-concept against parental ratings of their abilities is not expected to differ from those of whites.

2. Because blacks are more likely to perceive race-based negative stereotypes about their academic abilities in white-teacher classrooms than in black-teacher classrooms (while whites are neither more nor less likely to perceive such stereotypes in either classroom), the racial disparity in performance discounting is expected to be greater in white-teacher classrooms than in black-teacher ones.

3. School contexts are expected to moderate racial mismatch effects. For example, as per the group threat theory, white teachers are expected to feel increasingly more threatened and to respond with greater prejudice and hostility against black students as the proportion of the black student body increases. Therefore, the racial mismatch effect is expected to grow stronger as the percentage of minorities in school increases, and the degree of racial disparity in performance discounting is expected to increase. On the other hand, as per the token status theory, black students are less likely to feel stereotype-vulnerable the more they are surrounded by black students. In such cases, students may be less disposed to interpreting teachers' beliefs and attitudes as being prejudiced. In turn,

the racial mismatch effect may grow weaker as the percentage of minorities in school increases, and the degree of racial disparity in performance discounting may decrease.

For the reasons stated in the literature review, school climate and SES composition are also expected to moderate the influence of racial mismatch on performance discounting.

4. An individual child's academic self-concept is expected to follow a developmental path over the course of elementary and middle school, rather than staying fixed. Because of the developmental changes in children's cognitive abilities and social comparison skills, as well as changes in the nature of performance evaluations in school, children's academic self-concept is expected to decline over time. Likewise, because of developmental changes in the way children process the information required to construct their self-concept (less reliance on wishful thinking and more on outcomes; greater sophistication of social comparisons), children's academic self-concept is expected to become increasingly correlated with academic outcomes over time. That is to say, performance discounting is expected decline over time. However, because of the developmental changes in blacks' stereotype awareness that uniquely affect blacks' perceived stereotype, the steepness of the decline in performance discounting is expected to be different between blacks and whites. See Chapter 7 for the competing hypotheses.

5. Because stereotype threats can have enduring effects (cf. disidentification theory), students who are exposed to racial mismatch earlier in life (in our case, 3<sup>rd</sup> grade) are

expected to show more diverging racial gaps in performance discounting over time than those who are not.

6. Because the reflected appraisal process can be based on both external (e.g., peer comparison) and internal frames of reference (e.g., comparison to one's own prior score), the developmental path of performance discounting and its racial disparity may be distinct depending on whether the variation in achievement is dealt as "between-person" or "within-person". Performance discounting based on between-person achievement would constitute discounting one's average performance in comparison to the average performances of others, while the performance discounting based on within-person achievement would constitute discounting one's performance in comparison to his prior performance. Though there is no specific guidance from the literature on what we might expect to see in this particular setup, this study's assumption is that racial differences in attribution ambiguity due to perceived stereotypes should similarly exist in both types of appraisal processes; thus, the racial disparity in performance discounting should be evident in both between- and within-person performance discounting.

## CHAPTER 5

### DATA AND METHODS

This study used 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade data from the Early Childhood Longitudinal Study Kindergarten Cohort of 1998—1999 (ECLS-K). Data for academic self-concept was not available for 1<sup>st</sup> and 2<sup>nd</sup> grades, so these were excluded. The ECLS-K follows a nationally representative cohort of children from kindergarten in the fall and spring of 1998-99 through to the end of their 8<sup>th</sup> grade year in 2006-7. The study uses a multistage probability sampling design, using counties and groups of counties as the primary sampling units (PSU), the schools within the PSUs as the second stage, and the students within the sampled schools as the third stage. In the initial year there were a total of 22,666 students in a total of 1,277 schools. This dissertation focuses on 3<sup>rd</sup> and 8<sup>th</sup> grade for cross-sectional analyses, and 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade for panel analyses. The study only uses non-Hispanic white and black students.

#### *Analytic Sample*

The analytic samples consist of all non-Hispanic whites and blacks who were enrolled in regular (non-special education) classrooms: 7,502 white and 1,889 black students for 3<sup>rd</sup> grade, 5,916 white and 1,257 black students for 5<sup>th</sup> grade, and 5,212 white and 933 black students for 8<sup>th</sup> grade.

For cross-sectional analyses, missing observations were imputed separately for 3<sup>rd</sup> grade and 8<sup>th</sup> grade students. Most respondents had either a full set observations or just a few missing; for 3<sup>rd</sup> graders, more than 70% of respondents had either a full set of

observations or had no more than three variables with incomplete observations. For 8<sup>th</sup> graders, more than 70% of the respondents had either the full set of observations, or missing observations pertaining to a only single variable.

For panel analyses, missing observations were imputed together across the 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grades, with 3<sup>rd</sup> grade wave as the full sample (i.e., all respondents who were in 3<sup>rd</sup> grade wave but had observations missing in subsequent waves would have their missing observations imputed). Due to panel attrition, missing observations were more substantial in the panel analyses than in the cross-sectional analyses. For some variables there were no missing observations while for some other variables as much as 40% of the respondents showed missing values.

At the same time, the imputation diagnostics and the guidance by ECLS-K suggests that a missing-at-random assumption is reasonably tenable for both sets of analyses. In addition, sensitivity analyses based on listwise samples were conducted when the data permitted. All missing data were handled by multiple imputations (using “ice” in Stata 14.0 (Stata Corp., College Station, TX)) with the assumption that data was missing-at-random. Ten sets of complete data were imputed. This dissertation followed closely the recommendation of Allison (2001) for multiple imputations and the use of imputed data for regression analyses.

All descriptive analyses in the result chapters are weighted according to the sampling weights provided by ECLS-K. Despite non-responses and attrition across waves, the inverse probability weighting provided by ECLS-K allows the descriptive results to represent those of the baseline population, which is nationally representative. Regression

analyses do not require such weighting (cf. Winship & Radbill 1994). Finally, all standard errors were cluster-adjusted to account for the data's nested structure.

### *Measures*

The following is a list of key variables used in this study.

*Academic self-concept.* Academic self-concept was measured by Herbert Marsh's Self-Descriptive Questionnaire (SDQ) (Marsh 1990) items for reading/English. The specific items in this measure are: 1. I get good marks in reading. 2. I am good at reading. 3. Work in reading is easy for me. 4. I learn things quickly in reading. For 8<sup>th</sup> grade, the wording in the SDQ changes from “reading” to “English”: 1. English is one of my best subjects. 2. I get good grades in English.

The literature generally has not found subject-specific distinctions (e.g., reading vs. math) in how academic self-concept varies across races (e.g., Graham 1994). Some researchers have used a combined measure of reading and math to represent academic self-concept (e.g., Morgan & Mehta 2004), some have used reading alone (Kurtz-Costes et al. 1995), and some a comprehensive instrument that is not subject-specific (e.g., Phillips 1987). This dissertation uses reading/English alone, and performs sensitivity analyses with mathematics when the data permits.<sup>1</sup>

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<sup>1</sup> From kindergarten to 3<sup>rd</sup> grade, ECLS-K collected teacher rating for reading and math from just a single teacher associated with the respondent's “homeroom” teacher; however, beginning in 5<sup>th</sup> grade, ECLS-K collected teacher ratings for each academic subject separately from the subject-specific teachers associated with the respondent (i.e., “reading/English” teacher and “Math” teacher). By design, ECLS-K collected every respondent's reading/English teacher's rating, but, for mathematics, the teacher's rating was collected for only the *half* of the respondents (the other half being the teacher's rating for Science). In 8<sup>th</sup> grade, like in 5<sup>th</sup> grade, every respondent's English teacher's rating was collected, but, for mathematics, the decision to collect was based solely on whether or not the respondent previously had a Mathematics teacher's rating in 5<sup>th</sup> grade. Thus, the analyses based on Mathematics required unusually large number of missing observations to be imputed, beginning in 5<sup>th</sup> grade.

*Item Response Theory (IRT) scores.* This variable represents students' standardized test scores in reading. Although children in ECLS-K are not privy to information collected for the data purpose (e.g., IRT score), this study's operational assumption is that each of the performance measures in ECLS-K correlate with some real-world performance feedbacks. Students' IRT scores are assumed to correlate closely with school-administered standardized test scores.

In all three grade levels, the IRT-reading mainly assessed the reading component of verbal/English skills. Children were assessed on their proficiency pertaining to letter recognition, beginning sounds, ending sounds, sight words, comprehension of words in context, literal inference, extrapolation, and evaluation; in addition to these, children were assessed on evaluation of nonfiction in 5<sup>th</sup> grade and evaluation of complex syntax in 8<sup>th</sup> grade.

*Teacher ratings.* This variable represents teachers' performance feedback on students' proficiency in "language and literacy" (the term used by ECLS-K). Teachers were asked to rate students' skills, knowledge, and behaviors pertaining to multiple items in the domain of reading (e.g., "reads fluently", "comprehends expository text"), writing (e.g., "composes multi-paragraph stories/reports"), and speaking (e.g., "conveys ideas clearly when speaking"). Each rating scale ranged from 1 to 5, with 1 indicating the lowest perceived demonstration of proficiency and 5 the highest, and the scores are averaged. In 8<sup>th</sup> grade, this rating almost exclusively assessed the writing and oral components.

Despite variations in the exact content of the assessment within and across IRT and teacher ratings, the correlations between them were consistently high across the three

grade levels. In 3<sup>rd</sup> grade, the correlation between IRT for reading and teacher ratings for language and literacy was 0.58. In 5<sup>th</sup> grade it was 0.54, and in 8<sup>th</sup> grade it was 0.54.

*Parental Ratings.* This variable represents parents' perceptions of their child's reading ability. The survey asked, "Compared to other students, how well do you think your child is doing in reading?" The scoring ranged from 1 to 5, with 5 indicating the most positive response. In 8<sup>th</sup> grade, the survey no longer asked about the parental perception of a child's subject-specific ability but, rather, parental knowledge of the child's overall school performance grade.

For panel analysis, because a common survey question for parental rating was not available, another survey question—common to all three waves—was used. This survey question, however, pertained neither to parental perceptions of children's reading, nor to their overall academic ability, but rather to parental perception of their child's general ability to think, pay attention, and be independent. The question asked parents, "Does your child learn, think, and solve problems...; 2. Does your child pay attention to...; 3. Would you say your child is independent and takes of himself...", with the answers ranging from "better than other children," "as well as other children," "slightly less well than other children," and "much less well than others." The rating's correlation with the subject-specific parental ratings in 3<sup>rd</sup> grade was 0.4 and the overall academic parental rating in 8<sup>th</sup> grade 0.5.

*Student race/ethnicity.* A dichotomous variable of student race was constructed with two categories: "White" and "Black". Following Bates and Glick (2013), "White" consisted of non-Hispanic whites while "Black" consisted of non-Hispanic blacks and a few cases of children who were described by their parents as both "black" and "Hispanic"

(less than 3% of blacks). Because racial stereotyping occurs at the level of physical appearance (e.g., skin color) as much as at any other level, this study included the latter group as blacks.

*Teacher race/ethnicity.* A dichotomous variable for reading/English teachers was constructed with two categories: “Black teacher” and “Non-black teacher.” Following Bates and Glick (2013) and McGrady and Reynolds (2015), “Black teacher” represents both non-Hispanic and Hispanic black teachers (less than 2% of all black teachers). Teachers of all other races were categorized as “Non-black teacher.” All teachers were reading/English teachers (either homeroom teachers in 3<sup>rd</sup> grade or subject-specific English teachers in 5<sup>th</sup> and 8<sup>th</sup> grades).

Because an overwhelming majority of non-black teachers were white (more than 96%) and because studies have found similar stereotype disposition towards blacks by non-black minority teachers (e.g., Bates & Glick 2013; McGrady & Reynolds 2015), this study uses the language of “White teachers vs. Black teachers” to also mean “Non-black teachers vs. Black teachers”.

*Family SES.* Family socioeconomic standing (SES) was represented by the family composite variable, created at the household level, and based on the father/male guardian’s education, mother/female guardian’s education, father/male guardian’s occupation, mother/female guardian’s occupation, and household income. This dissertation used the family composite variable measured at the child’s kindergarten year and treated it as time-fixed throughout the analyses.

*Kindergarten cognitive scores.* To control for children’s early cognitive abilities, this dissertation included the variable for the children’s preschool cognitive assessments.

This variable is indicated by IRT scores on reading and math in the children's first and second semester of the kindergarten year. The scores were averaged over the two semesters.

*Sex.* This variable represents children's sex, either "male" or "female."

*Student engagement/motivation.* Children's level of school engagement/motivation was indicated by school records of their retention status, absence, and tardiness. Retention status represents whether a child has ever been held back a grade. The variable is dichotomous with two categories, "never been held back" and "held back at least once". Absence and tardiness represent a child's unexcused absences and tardiness, respectively. The variable for absence is dichotomous with two categories, "less than ten unexcused absences a year" and "at least ten or more unexcused absences a year". The threshold of "ten" was used based on a definition used in several states (e.g., New Jersey Department of Education; Connecticut Board of Education), which consider a child to be truant when absent ten or more times. The variable for tardiness is also dichotomous with two categories, "less than ten unexcused lateness a year" and "at least ten or more unexcused lateness a year". For 5<sup>th</sup> grade and 8<sup>th</sup> grade waves, data on children's absences and tardiness were unavailable (ECLS-K did not collect this information) and, thus, retention status was used as the sole proxy for student engagement/motivation.<sup>2</sup>

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<sup>2</sup> The analysis in 3<sup>rd</sup> grade later showed that retention status is the only variable out of the three that has statistically significant relationship with academic self-concept and its relation with achievement. Thus, this dissertation feels reasonably confident that the loss of these two variables did not significantly impact the study's results in the subsequent waves.

*School racial composition.* The racial composition of schools was indicated as the percentage of black students. The information was collected from both ECLS-K and the Common Core Data/Private School Universe Survey (CCD/PSS).

*School SES composition.* The SES composition of schools was indicated by the percentage of students who were eligible for free lunches. The percentage of free lunches was inversely related to school SES. The information was collected from both ECLS-K and CCD/PSS.

*School climate.* School climate was based on the fifteen survey questions that were answered by teachers. Teachers were asked a variety of questions relating to school climate broadly in three areas: 1) academic climate (e.g., “the academic standards at this school are low”), 2) disciplinary climate (e.g., “physical conflict is a serious problem in this school”), and 3) social (interpersonal) climate (e.g., “staff in this school generally has school spirit”). I combined these three data to generate a single, broad variable “school climate,” for which higher scores indicate a more positive school climate for students of all backgrounds to learn and achieve in. The internal consistency of this instrument was high, with a Cronbach alpha of 0.84. This variable was positively correlated with achievement (IRT, teacher ratings, parental ratings) and family SES while being negatively correlated with the percentage of blacks in school.

*Teacher characteristics.* To control for teachers’ individual characteristics, this dissertation included variables pertaining to teacher experience and education. Teacher experience was a continuous variable representing the number of years they had taught in schools. Teacher education was a dichotomous variable with two categories: “bachelor or less” or “beyond bachelor”.

### *Analytical Strategies*

This study used ordinary least squares (OLS) regression with robust standard error (adjusted for clustering) for cross-sectional analyses of the sample at 3<sup>rd</sup> and 8<sup>th</sup> grade. A multilevel growth curve model was used for panel analyses of the three waves of data (3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade).

*Cross-sectional analysis (Chapters 5 and 6).* OLS regression with robust standard error (adjusted for clustering) was chosen after running several other models for comparative purposes: Tobit, random effect, and fixed effect. Tobit models were run because of the potential ceiling effect of the dependent variable's top-heavy distribution. The random effect model was run because of the clustering within schools. The fixed effect model was run to control for the unobserved school heterogeneity. This study settled on an OLS robust standard error model (adjusted for clustering) because 1) Tobit model estimates showed that the ceiling effect was minimal; 2) the gain in efficiency using the random effect model was minimal (because the number of students per school was low); 3) the need to examine between-school effects precluded the fixed effect model from many analyses. Given the similar results given by all the models, OLS was considered the simplest and the easiest to interpret.

Different OLS model specifications were used to explore the three broad lines of research questioning as described by the working hypotheses: 1) The racial disparity in performance discounting; 2) the relationship between racial mismatch and racial disparity in performance discounting; 3) the moderating influences of school context on the relationship between racial mismatch and racial disparity in performance discounting.

For 1), the model is:

$$ASC_i = \beta_0 + \beta_1 ACH_i + \beta_2 RACE_i + \beta_3 ACH_i * RACE_i + \beta_7' \mathbf{W}_i + e_i$$

where  $ASC_i$  is the academic self-concept for student  $i$  (standardized);  $ACH_i$  is the achievement for student  $i$  (standardized);  $RACE_i$  is the race of student  $i$ ;  $ACH_i * RACE_i$  the two-way interaction between achievement and race for student  $i$ ;  $\mathbf{W}_i$  is the vector of controls for student  $i$  (sex, family SES, kindergarten cognitive scores, retention status, absence, tardiness, school % black, school % free lunch, and school climate);  $e_i$  is the disturbance term for student  $i$ . Based on the regression diagnostics, the assumptions for OLS were presumed to be met except for the *iid* assumption for  $e_i$  due to clustering. The standard errors were adjusted to take into account this violation.

Prior studies have long been interested in  $\beta_2$ , which represents the difference in the mean levels of academic self-concept of blacks and whites. This study's main focus was on  $\beta_3$ , which represents the difference in the association between academic self-concept and achievement (which is inversely related to performance discounting) between blacks and whites. A key hypothesis is that racial differences in performance discounting exist, even after accounting for factors pertaining to social comparison and disidentification perspectives (i.e., school context and student engagement/motivation). The study examined this hypothesis by running the model sequentially, adding the covariates  $\mathbf{W}$  to the basic set of predictors, and demonstrating that  $\beta_3$  remains substantial and statistically significant (namely, the association between academic self-concept and achievement would be smaller for blacks than for whites).

For 2), the model replaced student's race (RACE) with the variable cross-classifying student race with teacher race (STRACE), resulting in four categories: white-

white (WW), black-white (BW), white-black (WB), and black-black (BB). In running the OLS model, the nominal CTRACE was converted to four separate dummy variables (with WW omitted as the reference category):

$$ASC_i = \beta_0 + \beta_1 ACH_i + \beta_2 BW_i + \beta_3 WB_i + \beta_4 BB_i + \beta_5 ACH_i * BW_i + \beta_6 ACH_i * WB_i + \beta_7 ACH_i * BB_i + \beta_8 * W_i + e_i$$

In this set up,  $\beta_2$  represents the racial difference in mean academic self-concepts within white-teacher classrooms, while  $\beta_3 - \beta_4$  represents the racial difference in mean academic self-concepts in black-teacher classrooms. Likewise,  $\beta_5$  represents the racial difference in performance discounting in white-teacher classrooms, while  $\beta_7 - \beta_6$  represents the racial difference in performance discounting in black-teacher classrooms. The central hypothesis of this study is that racial disparities in performance discounting are significantly related to racial mismatch (namely, the racial difference in performance discounting would be smaller in black-teacher classrooms than in white-teacher classrooms). This is indicated by  $\beta_5 - (\beta_7 - \beta_6)$ .

For 3), a three-way interaction variable of achievement, race, and school context was included in the model. As mentioned, there were three school context variables: school percentage black (SBLK), school percentage free lunch (SLUNCH), and school climate (SCLIM). Each of these school context variables were examined separately for interactions with achievement and race. At the same time, the remaining two school context variables were retained in **W** as controls. All school context variables were continuous and centered. The model is as follows (SBLK is used as an example):

$$ASC_i = \beta_0 + \beta_1 ACH_i + \beta_2 SBLK_i + \beta_3 BW_i + \beta_4 WB_i + \beta_5 BB_i + \beta_6 ACH_i * SBLK_i + \beta_7 SBLK_i * BW_i + \beta_8 SBLK_i * WB_i + \beta_9 SBLK_i * BB_i + \beta_{10} ACH_i * BW_i$$

$$\begin{aligned}
& + \beta_{11} ACH_i * WB_i + \beta_{12} ACH_i * BB_i + \beta_{13} ACH_i * SBLK * BW_i \\
& + \beta_{14} ACH_i * SBLK * WB_i + \beta_{15} ACH_i * SBLK * BB_i + \beta_{16} W_i + e_i
\end{aligned}$$

where  $\beta_{10}$  represents the racial disparity in performance discounting in white-teacher classrooms for the *average* school % black, which is centered, while  $\beta_{10} + \beta_{13} SBLK$  represents the racial disparity in performance discounting in white-teacher classrooms for any other levels of racial composition of school, SBLK. Likewise,  $\beta_{11} - \beta_{12}$  represents the racial disparity in performance discounting in black-teacher classrooms for the *average* school % black, while  $(\beta_{11} - \beta_{12}) + (\beta_{14} - \beta_{15}) SBLK$  represents the racial disparity in performance discounting in black-teacher classrooms for any other levels of racial composition of school, SBLK. A key research issue this study examines is that school context moderates the racial disparity in performance discounting and its relation with racial mismatch. To examine whether the racial composition of schools moderated racial disparity in performance discounting in white-teacher classrooms, this study tested  $\beta_{10} + \beta_{13} SBLK$  at three different levels of SBLK: one standard deviation below the mean SBLK, mean SBLK, and one standard deviation above the mean SBLK. If there are substantial and statistically significant differences in  $\beta_{10} + \beta_{13} SBLK$  across these three levels of SBLK, then it is likely that the racial composition of schools does moderate racial disparity in performance discounting in white-teacher classrooms. The same strategy was used for testing black-teacher classrooms;  $(\beta_{11} - \beta_{12}) + (\beta_{14} - \beta_{15}) SBLK$  was tested across three different levels of SBLK. To examine whether the racial composition of schools moderated the relationship between racial mismatch and the racial difference in performance discounting, the differences of the above two test-statistics were examined at three different levels of SBLK. That is,  $[\beta_{10} + \beta_{13} SBLK] - [(\beta_{11} - \beta_{12}) + (\beta_{14} -$

$\beta_{15}$ ) SBLK] was tested at low, mid, and high levels of SBLK. Substantial and statistically significant differences in this test statistic across SBLK levels would indicate that the racial composition of schools moderates the racial mismatch effect on racial disparity in performance discounting. The above procedure was repeated for SES composition of schools (SLUNCH) and school climate (SCLIM).

The regressions for all cross-sectional analyses noted here were run based on multiply imputed data. Stata version 14.0 (Stata Corp., College Station, TX) was used for all analyses, including descriptive statistics and regression diagnostics. OLS regressions were run using Stata command “mi estimate: reg” with an option “cluster (\*)” for standard errors adjusted for clustering. The equality of coefficient tests were performed with the Stata command “mi testtransform”.

*Panel analysis (Chapter 7).* For panel analyses, a multilevel growth curve model was used to model the stability and change in individuals’ academic self-concepts and their relation to achievement (Level-1) and the ways these patterns differed across individuals (Level-2) over three time points: 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade. This model was well suited for to the research questions because it simultaneously addresses the developmental question of within-person changes over time (how academic self-concept and its relation to achievement changes over time) and between-person differences (how these changes differ across children).

Three different model specifications were used to examine the three broad research questions described by hypotheses: 1) The racial disparity in the developmental trajectories of performance discounting; 2) the racial disparity in performance

discounting based on between- vs. within-person achievement; 3) the relationship between early exposure to racial mismatching and the developmental trajectories of performance discounting and its racial differences.

For (1), the model is,

$$ASC_{it} = \beta_{0i} + \beta_{1i} \text{ time} + \beta_{2i} ACH_{it} + \beta_{3i} \text{ time} * ACH_{it} + \beta_7' \mathbf{W}_{it} + e_{it} \quad (\text{Level 1})$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01} RACE_i + \gamma_{02}' \mathbf{Z}_i + u_{0i} \quad (\text{Level 2})$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11} RACE_i + \gamma_{12}' \mathbf{Z}_i + u_{1i} \quad (\text{Level 2})$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21} RACE_i + \gamma_{22}' \mathbf{Z}_i \quad (\text{Level 2})$$

$$\beta_{3i} = \gamma_{30} + \gamma_{31} RACE_i + \gamma_{32}' \mathbf{Z}_i \quad (\text{Level 2})$$

where  $ASC_{it}$  is the academic self-concept for student  $i$  at time  $t$  (standardized at each wave, not across waves); time is the grade level, with the third grade set as time=0;  $ACH_{it}$  is the achievement for student  $i$  at time  $t$  (standardized at each wave, not across waves); Time\* $ACH_{it}$  is the two-way interaction between time and achievement for student  $i$  at time  $t$ ;  $\mathbf{W}_{it}$  is the vector of time-varying controls for student  $i$  (school % black, school % free lunch, and school climate);  $e_{it}$  is the within-person disturbance for student  $i$  at time  $t$ ;  $RACE_i$  is the race of student  $i$ ;  $\mathbf{Z}_i$  is the vector of time-fixed controls for student  $i$  (sex, family SES, kindergarten cognitive score, retention status);  $u_{0i}$  and  $u_{1i}$  are the between-person disturbances for the intercept  $\beta_{0i}$  and slope  $\beta_{1i}$  for student  $i$ , respectively. The trajectory of academic self-concept for each child was allowed to vary freely around the mean trajectory, with random effects specified for both intercept ( $\beta_{0i}$ ) and slope ( $\beta_{1i}$ ).<sup>3</sup> The conventional assumptions for the growth curve model were presumed to be met, with  $e_{it}$  being normally distributed and  $u_{0i}$  and  $u_{1i}$  being bivariate normally distributed.

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<sup>3</sup> We also examined random slopes for achievement and achievement\*time, but none of the models converged.

Coefficient  $\beta_{0i}$  is the initial level (i.e., 3<sup>rd</sup> grade) of academic self-concept for student  $i$ , and  $\gamma_{00}$  is the mean initial level of academic self-concept across all students. Coefficient  $\gamma_{01}$  is the racial difference in the mean initial level of academic self-concept between blacks and whites, and  $\beta_{1i}$  is the rate of growth of academic self-concept for student  $i$ , while  $\gamma_{10}$  is the mean rate of growth of academic self-concept across all students. Coefficient  $\gamma_{11}$  is the racial difference in the mean rate of growth of academic self-concept between blacks and whites. Coefficient  $\beta_{2i}$  is the association between academic self-concept and achievement (or performance discounting) for student  $i$ , and  $\gamma_{20}$  is the mean association between academic self-concept and achievement across all students. Coefficient  $\gamma_{21}$  is the racial difference in the mean performance discounting between blacks and whites. Coefficient  $\beta_{3i}$  is the interaction between time and performance discounting (or how much performance discounting changes over time) for student  $i$ , which represents the *developmental path of performance discounting* for student  $i$ . Coefficient  $\gamma_{30}$  is the mean interaction between time and performance discounting across all students—or equivalently, the mean developmental path of performance discounting. A key hypothesis of this study is that performance discounting does not remain fixed over time but follows a developmental path (i.e.,  $\gamma_{30} \neq 0$ ). Another key hypothesis is that the developmental path of performance discounting is distinct for blacks and whites. This is indicated by  $\gamma_{21} (\neq 0)$ , which represents the racial difference in the interaction between time and performance discounting.

For 2), the model decomposes ACH into two parts: within-person (DACH) and between-person (MACH).

$$ASC_{it} = \beta_{0i} + \beta_{1i} \text{ time} + \beta_{2i} \text{ DACH}_{it} + \beta_{3i} \text{ time} * \text{DACH}_{it} + \beta_7' \mathbf{W}_{it} + e_{it} \quad (\text{L1})$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01} \text{RACE}_i + \gamma_{02} \text{MACH}_i + \gamma_{03} \text{RACE}_i * \text{MACH}_i + \gamma_{04}' \mathbf{Z}_i + u_{0i} \quad (\text{L2})$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11} \text{RACE}_i + \gamma_{12} \text{MACH}_i + \gamma_{13} \text{RACE}_i * \text{MACH}_i + \gamma_{14}' \mathbf{Z}_i + u_{1i} \quad (\text{L2})$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21} \text{RACE}_i + \gamma_{22} \text{MACH}_i + \gamma_{23} \text{RACE}_i * \text{MACH}_i + \gamma_{24}' \mathbf{Z}_i \quad (\text{L2})$$

$$\beta_{3i} = \gamma_{30} + \gamma_{31} \text{RACE}_i + \gamma_{31} \text{MACH}_i + \gamma_{33} \text{RACE}_i * \text{MACH}_i + \gamma_{34}' \mathbf{Z}_i \quad (\text{L2})$$

where  $\text{MACH}_i$  is the *mean* achievement for student  $i$  across three waves;  $\text{DACH}_{it}$  is the *deviation* of student  $i$ 's achievement at time  $t$  from his mean achievement ( $\text{MACH}_i$ );<sup>4</sup>  $\text{time} * \text{DACH}_{it}$  is the two-way interaction of time and deviation of achievement for student  $i$  at time  $t$ ;  $\text{RACE}_i * \text{MACH}_i$  is the two-way interaction between race and the mean achievement of student  $i$ .

Coefficient  $\beta_{2i}$  is the association between academic self-concept and within-person achievement for student  $i$  (or, equivalently, the “within-person” performance discounting for student  $i$ ). In other words,  $\beta_{2i}$  measures how a child’s academic self-concept responds to the changes in his performance from his prior performance (or from his average performance). Coefficient  $\gamma_{30}$  is, then, the mean “within-person” performance discount across all students. Coefficient  $\beta_{0i}$  is the initial level of academic self-concept for student  $i$  (or any average level of academic self-concept for which  $\text{time}=0$  for student  $i$ ). Coefficient  $\gamma_{02}$  (the coefficient for  $\text{MACH}$ ) is, then, the relationship between the average levels of academic self-concept and average levels of achievement across all students (or, equivalently, the “between-person” performance discount). A key research question is whether the racial disparity in performance discounting is similar for within- and between-person performance; if they are distinct, it would suggest that blacks’ performance discounting and its conjectured mechanism based on perceived stereotype

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<sup>4</sup> Note that both  $\text{MACH}$  and  $\text{DACH}$  are not time dependent (cf. Curran & Bauer 2011), as  $\text{ACH}$  is not time dependent. As mentioned earlier,  $\text{ACH}$  is standardized at each period.

may not be uniform across the child's use of internal and external frames of reference. This question can be examined by  $\gamma_{21}$  and  $\gamma_{03}$ , which represents the racial difference in the within-person and between-person performance discounting, respectively. Finally, the developmental path of performance discounting for within-person performance is represented by  $\beta_{3i}$  for student  $i$ , and their mean path by  $\gamma_{30}$ ; the racial disparity in the developmental path of performance discounting is represented by  $\gamma_{31}$ . For between-person performance, the developmental path of performance discounting is represented by  $\gamma_{12}$  and its racial disparity by  $\gamma_{13}$ .

For 3), subsample analyses were used to examine how the *early* racial mismatch is related to distinct developmental paths of performance discounting across race. To that end, four subsamples were created based on the mismatch pattern of 3<sup>rd</sup> grade and the subsequent two waves:

(Group 1) white teacher in 3<sup>rd</sup> grade & white teacher in 5<sup>th</sup> & 8<sup>th</sup> grade

(Group 2) *black teacher* in 3<sup>rd</sup> grade & white teacher in 5<sup>th</sup> & 8<sup>th</sup> grade

(Group 3) white teacher in 3<sup>rd</sup> grade & *black teacher* in 5<sup>th</sup> or 8<sup>th</sup> grade

(Group 4) *black teacher* in 3<sup>rd</sup> grade & *black teacher* in 5<sup>th</sup> or 8<sup>th</sup> grade

The sample size/coverage for each group was as follows: Group 1) Total = 7874; white = 7012, black = 862; Group 2) Total = 234; white = 123, black = 111; Group 3) Total = 889; white = 635, black = 254; Group 4) Total = 500; white = 49, black = 451. For each group, the growth curve model was run. Because the mismatch patterns of 5<sup>th</sup> and 8<sup>th</sup> grade needs to be controlled for (in order to better isolate the influence of 3<sup>rd</sup> grade mismatch pattern), the comparisons of estimates were made between Group 1 and Group 2 (i.e., among those who had white teacher in 5<sup>th</sup> and 8<sup>th</sup> grade) and between Group 3 and

Group 4 (i.e., among those who had black teacher in 5<sup>th</sup> or 8<sup>th</sup> grade). To explore whether the developmental path of performance discounting varied by early racial mismatching,  $\gamma_{30}$  (for within-person) and  $\gamma_{12}$  (for between-person) were compared across Groups 1 and 2 and across Groups 3 and 4. To examine whether the racial disparity in these paths was distinct from early racial mismatching,  $\gamma_{31}$  (for within-person) and  $\gamma_{13}$  (for between-person) were compared across Groups 1 and 2 and across Groups 3 and 4.

The regressions for all panel analyses noted here except the last were run based on multiply imputed data. The model in the subsample analysis was run based on a single imputed data due to convergence issues; however, the results were compared across ten dataset for robustness. Stata version 14.0 (Stata Corp., College Station, TX) was used in all analyses, including descriptives and diagnostics. Growth curve models were run with the Stata command “mi estimate: xtmixed” with the option “|| id: time” for random intercept and slope (for “time”).

Lastly, for both cross-sectional and panel analyses, sensitivity analyses were conducted evaluating the impact of specific operationalizations (e.g., using math and reading combined for academic self-concept and achievement) and imputation procedures (e.g., choosing 8<sup>th</sup> grade wave as the full sample wave for imputation in panel analyses). The final analytic results were largely robust to different specifications.

**CHAPTER 6**  
**EMPIRICAL ANALYSIS I:**  
**RACIAL DISPARITY IN THE RELATIONSHIP BETWEEN 3<sup>RD</sup> GRADERS’**  
**ACADEMIC SELF-CONCEPT & ACHIEVEMENT**

Performance discounting theory has been suggested as explaining black students’ relatively weak association between academic self-concept and achievement, but the theory has never been tested beyond laboratory settings for large populations. In addition, the theory’s applicability to young children is unclear. This chapter takes the social psychology theory of performance discounting, situates it under a broader institutional environment of schools, and applies it to a generalizable sample of young children. In doing so, two strands of literature can be bridged—the social psychology literature on performance discounting, and the sociology literature on racial mismatch—to see how performance discounting is structurally patterned by the racial matching of teachers and students. The key theoretical assumptions of this study are that 1) people who are subjected to negative stereotypes tend to attribute poor outcomes to bias and prejudice (e.g., Crocker & Major 1989) and 2) that teachers’ race-based ability stereotyping of students varies according to their racial matching (e.g., Downey & Prebish 2002; McGrady & Reynolds 2013). This study argues that black students in white-teacher classrooms are structurally conditioned to perceive more racial stereotype about academic abilities and, thus, experience greater ambiguity in assessing the causes of their academic performance (i.e., “attributional ambiguity”), resulting in greater performance discounting. Furthermore, this structural pattern in performance discounting is expected

to vary across different school contexts, as well as across different measures of achievement.

This chapter is organized as follows. First, the descriptive results of the bivariate and trivariate analyses are presented, demonstrating that a racial disparity in the association between academic self-concept and achievement exists for 3<sup>rd</sup> graders. Second, the findings from the multivariate analyses are presented, showing that racial disparity exists above and beyond the influences of the factors pertaining to social comparison and disidentification theories. The fact that this disparity remains mostly unexplained, even after controlling for these factors, is highlighted. Third, the effects of student-teacher racial mismatching are investigated. Finally, the results from the analyses testing whether classroom patterning of performance discounting is moderated by school context are presented.

This chapter will use acronyms and shorthand expressions for frequently-used phrases. The phrase “association between academic self-concept and achievement” (or “relationship between academic self-concept and achievement”) will be abbreviated to ABAA. Likewise, “student-teacher racial mismatch” will be referred to as “racial mismatch”. Finally, as already noted, all mentions of “academic self-concept” and “achievement” (IRT, teacher and parent ratings) will always be referring to *English/reading* academic self-concept and *English/reading* achievement, respectively, unless otherwise noted.

## DESCRIPTIVE FINDINGS

### *Racial Differences in Academic Self-Concept, 3<sup>rd</sup> Grade*

In ECLS-K, 3<sup>rd</sup> graders rated themselves how good they were academically (i.e., in English/reading) on a scale of 1 to 4. On average, both blacks and whites rated themselves highly: 3.26 for blacks and 3.23 for whites, with standard deviations (SD) of 0.02 for each.<sup>5</sup> This racial difference in academic self-concept, though small and statistically insignificant overall, became sizable when broken down into different achievement levels. Of low-achieving children (who scored at least one standard deviation below the mean IRT), blacks' academic self-concept score (mean  $\pm$  SD) was  $3.11 \pm 0.04$ , significantly higher than the  $2.85 \pm 0.04$  of their white counterparts (Table 5.3). Likewise, among mid-level achievers, blacks reported an academic self-concept score (mean  $\pm$  SD) of  $3.32 \pm 0.02$ , which was significantly higher than the whites' score of  $3.21 \pm 0.01$  (Table 5.3). Only high achievers (scoring at least one standard deviation above the mean IRT) showed no racial differences in academic self-concept. This statistical insignificance may be partly due to the lower sample size of black students in the high achievement level ( $n = 66$ ) and their widely-distributed scores, but the difference of mean was still much smaller than that of other two achievement levels. This pattern was duplicated when using teacher ratings as a measure of achievement. There was a substantial racial difference in the mean academic self-concept in low achievers ( $3.05 \pm 0.04$  for blacks vs.  $2.86 \pm 0.03$  for whites,  $p < 0.05$ ), a modest difference in mid achievers ( $3.30 \pm 0.03$  vs.  $3.23 \pm 0.01$ ,  $p < 0.10$ ), and a negligible difference in high achievers ( $3.56 \pm 0.12$  vs.  $3.54 \pm 0.02$ ,  $p = ns$ ). For parental rating, there was a significant racial difference in academic self-concept in low achievers but negligible differences in both mid and high achievers.

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<sup>5</sup> Table 6.1 shows a brief note on the variable properties. Table 6.2 provides summary statistics by race.

The findings above suggest a mechanism of *selective attribution* (cf. Weiner 1984; Crocker & Major 1989) at work among black students. Not all blacks showed optimistic academic self-belief, only low- and mid-level achievers. In particular, low achieving blacks rated themselves more highly than did their counterpart whites. There was little or no racial difference in academic self-concept among those who had high achievement. This pattern suggests that the *relationship* between academic self-concept and achievement is likely to differ for blacks and whites.

*Racial Differences in the Bivariate Correlation between Academic Self-Concept & Achievement, 3<sup>rd</sup> Grade*

Table 6.4 shows the bivariate correlations between academic self-concept and achievement for the 3<sup>rd</sup> graders. Bivariate correlation measures the linear relationship between two continuous variables. As expected, blacks showed a significantly weaker relationship between academic self-concept and achievement than did whites. The correlation between academic self-concept and test scores was more than 40% weaker for blacks than for whites (0.20 vs. 0.34,  $p < 0.05$ ), some 25% weaker with respect to teacher ratings (0.24 vs. 0.32,  $p < 0.05$ ), and to parental ratings (0.24 vs 0.31,  $p < 0.05$ ).

As expected, there was a strong correlation between test scores and teacher ratings—0.61 for blacks and 0.64 for whites. The relationships of parental rating with test score and teacher ratings were each moderately strong, but weaker for blacks than for whites in both cases. This latter finding is somewhat consistent with the studies that suggest racial discrepancies in parental knowledge of their children's school performance

(Alexander, Entwisle, & Bedinger 1994). It remains to be seen how such differences affect students' performance discounting.

*Social Comparison & Disidentification, 3<sup>rd</sup> Grade*

Blacks' weaker correlations between academic self-concept and achievement (Table 6.4) may be a consequence of two important factors that are related to self-concept and race/ethnicity: school composition (cf. social comparison theory) and children's academic engagement/motivation (c.f., disidentification theory). Studies show that social comparison plays a significant role in the construction of self-concept (Rosenberg & Simmons 1972; Johnson, Crosnoe, & Elders 2001; Goldsmith 2004; Crosnoe 2009). As such, school composition and school climate are suggested to influence individual differences in the correlation between academic self-concept and achievement. Studies also suggest students' level of academic engagement/motivation, especially the level of students' identification (or disidentification) with academics (Steele 1992; 1997; Steele & Aronson 1995; Osborne 1995; Major et al 1998), may influence how close students' academic self-concept follows their achievement. As such, students' retention status, absence, and tardiness are also suggested to influence individual differences in the correlation between academic self-concept and achievement. Finally, research has explored how race-ethnicity relates to these two factors (e.g., Coleman et al. 1966; Johnson, Crosone, & Elder 2001).

Table 6.5 provides an empirical sketch of the issues above. The table shows how the school contexts—as represented by racial and SES composition and school

climate<sup>6</sup>—and student engagement/motivation—as represented by student’s retention status, absence, and tardiness<sup>7</sup>—might relate to individual differences in the bivariate correlation between academic self-concept and achievement. The table also shows how these factors might relate to race. As expected, the bivariate correlations between children’s academic self-concept and achievement differed significantly across school composition and school climate. For example, children in schools that had top 75 percentile percentage of black students (i.e., “More Black”) showed lower correlations between academic self-concept and test scores than those in “More White” schools (0.17 vs. 0.31,  $p < 0.05$ ). Likewise, children in schools with a 75 percentile percentage of free lunch-eligible students (i.e., “More Poor”) had lower correlations than those from “More Rich” schools. Likewise, those in schools with low school climate showed lower correlations between academic self-concept and test scores than those with high climate. Moreover, students who had been held back in grade(s) and had more incidences of unexcused absence and tardiness displayed lower correlations between academic self-concept and test scores than those who had not (0.17 vs. 0.29,  $p < 0.05$  for retention status;  $0.14 < 0.28$ ,  $p < 0.05$  for absence;  $0.17 < 0.27$ ,  $p < 0.05$  for truancy). As expected, children’s race was significantly related to all factors. For example, in comparison to whites, blacks were nearly 11 times more likely to have been in “More Poor” schools, three times more likely to be in “Low Climate” schools, twice as likely to have been held back a grade, and so on.

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<sup>6</sup> In the regression analysis, each school context variable is used as a continuous measure, but, for the correlation analysis here, each variable is dichotomized. I used the top quartile and the bottom quartile to dichotomize each school context variable (e.g., the top 75 percentile school percentage blacks as “more black” and bottom 25 percentile school percentage black as “more white”). See the notes in Table 6.5.

<sup>7</sup> In the regression analysis, absence and tardiness are used as continuous measures, but, for the correlation analysis here, they are each dichotomized (truancy vs. non-truancy). Based on the definitions used in several states (e.g., NJ; CT), I defined the truancy level of absence to be ten or more unexcused absences and the truancy level of tardiness as ten or more unexcused tardiness.

The patterns above suggest the need to take into account these two sets of factors (school context and student engagement) in subsequent analysis of performance discounting strategy. Would blacks (vs. whites) show weaker ABAA regardless of the racial composition of their schools? Would blacks show weaker ABAA whether or not they had been held back a grade or not? If so, would racial mismatch explain these differences? To answer these and related questions, I now turn to the multivariate analysis.

## MULTIVARIATE ANALYSIS

### *Racial Disparity in ABAA, 3<sup>rd</sup> Grade*

Table 6.6 shows the results for the regression of academic self-concept on race, test scores, their interaction, and covariates. An OLS regression model with robust standard error (adjusted for clustering) was run in a sequential manner with block covariates.<sup>8</sup> Both dependent and achievement variables were standardized for the purpose of comparing regression coefficients across covariates and across models.<sup>9</sup> I now use this model to answer this dissertation's research questions.

*Research Question 1. Is there a difference in the association between academic self-concept and achievement between black and white children in the U.S. 3<sup>rd</sup> grade? If so, how much is this racial difference in ABAA above and beyond the influences of students' demography, school contexts, and academic engagement?*

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<sup>8</sup> As already mentioned, the final estimates were compared with the estimates obtained from three other modeling strategies—Tobit, random effect, and fixed effect. Tobit was used because of the potential ceiling effect of the top-heavy distribution of the dependent variable. Random effect was used because of the cluster design of the sample. Fixed effect was used solely to examine the within-student estimates. This study settled on the OLS robust standard error model because 1) the data structure was such that the gain in efficiency of a random effect model would be minimal (low number of students per school); 2) the need to examine between-school effects precluded a fixed effect model in many analyses; 3) Tobit model estimates showed that the ceiling effect was minimal. The results were generally similar across different strategies.

<sup>9</sup> Models were also run using non-standardized variables, and the results were essentially identical except the inflated t-statistics for the intercept in the non-standardized version.

Model 1 shows that academic self-concept was strongly associated with achievement but that this association was weaker for blacks than for whites. For whites, a one SD increase in test score was associated with a 0.355 SD increase in academic self-concept ( $p < 0.05$ ) but, for blacks, there was only a 0.202 SD increase ( $p < 0.05$ ). Model 1 shows that the mean academic self-concept was 0.248 SD higher for blacks than for whites among the average test-scorers (i.e., those whose test scores were near the mean), but such mean-level differences were much greater among lower achievers than higher achievers. Model 2 accounted for the basic demographic characteristics of the students (sex, family SES, and kindergarten cognitive score) and it shows that the patterns remained largely the same. Model 3 accounted for the racial and SES compositions of schools, school climate, retention status, absence, and tardiness, and it shows that these factors significantly reduced the differences in academic self-concept between average-achieving blacks and whites; however, the racial disparity in ABAA remained largely intact. From Model 2 to Model 3, the mean-level difference by race declined from 0.240 ( $p < 0.05$ ) to 0.135 ( $p < 0.05$ ), a decline of 44%, while the racial difference in ABAA declined from 0.152 ( $p < 0.05$ ) to 0.113 ( $p < 0.05$ ), a more modest decline of 25%.<sup>10</sup> In other words, even with the two popular explanations for the racial differences in self-concept, there still remained a fairly substantial amount of racial difference in ABAA. In the final model, blacks' ABAA was still some 30% weaker than that of whites.<sup>11</sup> This last result supports our expectation that ABAA would be weaker for blacks than for whites even after accounting for the factors pertaining to social comparison and disidentification.

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<sup>10</sup>  $0.44 = 1 - (0.135 / 0.240)$ ;  $0.25 = 1 - (0.113/152)$

<sup>11</sup>  $0.30 = 0.113 / 0.376$ . This difference is somewhat less dramatic when fixing all effects of school (FE model) but still large at 22% weaker for blacks.

*Research Question 1(auxiliary).*

*Does the racial difference in ABAA vary according to the type of achievement measure (e.g., test score, teacher rating, parental rating)?*

Table 6.7 arrays the racial disparity in ABAA across three achievement ratings: test scores, teacher ratings, and parental ratings. The findings suggest partial support for our expectation that the racial disparity in ABAA would be lower when using parental ratings as the achievement measure. The rationale for this conjecture was that blacks would be less inclined to discredit parental evaluations than they would test scores or teacher ratings that were potentially influenced by stereotypes. This conjecture is supported, as black children (vs. white children) showed less discounting of parental belief (22% weaker ABAA,  $p < 0.05$ ) in comparison to test scores (30% weaker ABAA) and to teacher ratings (24% weaker ABAA,  $p < 0.05$ ). It was, however, still a surprise to find blacks' discounting of parental ratings to be as high as it was, and not as dramatically different from the other two measures. This suggests that blacks might be inclined to doubt even their parents' attitudes and beliefs towards their academic abilities, not just the evaluations they receive in schools.

Contrary to expectation, the racial disparity in ABAA was not largest when using teacher ratings. Instead, test scores produced a larger disparity. This study's assumption was that, of the three types of performance evaluations, teacher evaluations would induce the highest level of perceived stereotype. Why, then, did this hypothesis fail? One possibility, speculatively, is that the discounting process may be contingent not just on perceived stereotypes, but also on the level of ease by which performance evaluation can be disregarded. In this study, teacher ratings are assumed to represent performance feedback in the form of teachers' attitudes/beliefs conveyed directly to students in the

classroom, as well as report card marks. Meanwhile, test scores (IRT) represent standardized tests which are given out less frequently and can be more ambiguous to interpret than teacher's verbal feedback and/or report card marks. Researchers would agree that teachers' performance evaluations are more salient and easier to understand than standardized test scores (e.g., Wylie 1979; Hansford & Hattie 1982), which are often distant and benchmarked in reference to national norms—which most children are too young to incorporate into their social comparisons (Stipek & MacIver 1989). If such is the case, then 3<sup>rd</sup> graders might find it easier to disregard poor test scores than poor teacher ratings as the former leave more room for ambiguity and, therefore, selective attribution (cf. Allport & Postman 1947). Of course, another reason for the failure of the hypothesis might be that our assumptions behind it were not empirically met and/or the mechanism of performance discounting is not what was assumed.

In sum, the regression results (Tables 6.6 and 6.7) shows that, for U.S. 3<sup>rd</sup> graders, blacks tended to hold higher academic self-concept than their white counterparts. However, not all blacks showed equivalently high self-concepts. Differences were greatest among low achievers and least among high achievers. The racial difference in the mean-levels of academic self-concept was substantially explained by the information on school context and students' engagement/motivation, but this information did not explain as much of the racial difference in ABAA. Even with all relevant controls, blacks' academic self-concept was some 30% less strongly associated with test scores, and some 24% less strongly associated with teacher ratings than were whites'.

What then, could explain this remaining racial gap in ABAA? Next, I examine student-teacher racial mismatching as a potential structural determinant.

### *Racial Mismatch and Racial Disparity in ABAA, 3<sup>rd</sup> Grade*

Students could be purposeful in accepting or rejecting performance measures that confirm or contradict their beliefs of their own academic abilities (Lipmann ; Allport & Postman). The theory of performance discounting describes how a person might selectively attribute oneself as the causal agent of a certain outcome, as opposed to attributing that outcome to an external factor such as a teacher's racial bias. Racial disparity in ABAA points to such a process, in which blacks may be able to disregard poor performances more readily than whites due to their perceived racial bias against them. This study conjectured that ABAA would be weaker for blacks than for whites because blacks are more likely to experience student-teacher racial mismatches, which, according to the literature, would result in more racial bias being perceived by blacks than by whites. Specifically, this study hypothesized that the racial disparity in ABAA would be greater in white-teacher classrooms than in black-teacher classrooms.

#### *Research Question 2.*

*Is the racial disparity in ABAA greater in white-teacher classrooms than in black-teacher classrooms?*

Table 6.8 shows the regression results. The dependent variable is academic self-concept and the key predictors are student-teacher race, achievement, and its two-way interaction. The student-teacher race variable is a nominal variable with four categories that are constructed from matching student's races with those of their teachers. For example, "white-black" indicates a white student in a black-teacher classroom, while

“black-white” indicates a black student in a white-teacher classroom.<sup>12</sup> This nominal variable was converted into dummy variables and included in the regression model with “white-white” as the reference. The covariates for the regression analysis included teacher experience and teacher education, in addition to all the covariates in the prior models, including sex, family SES, kindergarten cognitive scores, school % blacks, school % free lunch, school climate, retention status, absence, and tardiness.

Table 6.8 shows that the hypothesis that the racial gap in ABAA would be greater in white-teacher classrooms than black-teacher ones was not supported or is, at best, unclear. To test, the racial gap in ABAA among students in white-teacher classrooms was first considered. This was done by comparing the estimates between “White-White\*Ach” and “Black-White\*Ach”, which represented the two-way interaction between child-teacher race and achievement for white students in white-teacher classrooms and black students in black-teacher classrooms, respectively. The difference was 0.118 SD ( $p < 0.01$ ) (The  $p$ -value for this contrast is shown next to “(a) vs (c)” under the test score column). For whites in white-teacher classrooms, every one SD increase in test score was associated with a 0.377 SD ( $p < 0.01$ ) increase in academic self-concept. For blacks in white-teacher classrooms, every one SD increase in test score was only associated with a 0.259 SD increase, which was 0.118 SD less than that of whites. Blacks’ ABAA was 31% weaker than that of whites in white-teacher classrooms.

Next, I considered differences in the ABAA of blacks and whites in black-teacher classrooms: “White-Black\*Ach” vs. “Black-Black\*Ach”. For whites in black-teacher

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<sup>12</sup> In terms of the sample size/coverage, there were 9,391 3<sup>rd</sup> grade students, of which there were 7,323 white students with white teachers (white-white), 179 white students with black teachers (white-black), 1,305 black students with white teachers (black-white), and 584 black students with black teachers (black-black).

classrooms, every one SD increase in test score was associated with 0.359 SD increase in academic self-concept ( $0.359 = 0.377 - 0.018$ ) while for blacks there was a 0.289 SD increase ( $0.289 = 0.377 - 0.097$ ). The difference was 0.079 SD but not statistically significant. The  $p$ -value is shown in “(b) vs (d)”, which was 0.42.

Next, as the final step for our testing, I compared racial difference in ABAA between white-teacher classrooms and black-teacher classrooms; that is, I tested the difference of the two differences, 0.118 ( $p < 0.01$ ) vs. 0.079 ( $p = 0.42$ ). This linear combination was not statistically significant. Our hypothesis for the racial mismatch effect was not supported. Teacher’s race did not matter in the racial disparity in performance discounting. However, one could possibly argue that the racial difference in the association was present only in white-teacher classrooms, not in black-teacher classrooms, because the racial gap in ABAA was statistically significant only in white-teacher classrooms. However, the results for black-teacher classrooms had less statistical power due to a much lower sample size. Other data with a larger cell size is needed to test this hypothesis..

I also compared ABAA between just the black students across teacher’s race, and the difference in this instance was also not significant. Using test scores, the ABAA of blacks in white-teacher classrooms and in black-teacher classrooms were nearly identical, at 0.26 and 0.28, respectively ( $p = 0.74$ )<sup>13</sup>. The results were similar when using teacher ratings (0.034,  $p = 0.57$ ) and using parental rating (0.062,  $p = 0.38$ ).

The racial mismatch, however, was not without any effects on academic self-concepts. On the one hand, blacks in white-teacher classrooms showed *lower* mean

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<sup>13</sup> From the table,  $-0.097 - (-0.118) = 0.021$ . The  $p$ -value is shown next to “(c) vs (d)” under the column for test-score: 0.74.

academic self-concept than in black-teacher classrooms.<sup>14</sup> On the other hand, in both white and black-teacher classrooms, blacks showed *higher* self-concept than whites.<sup>15</sup> Incidentally, among whites, teacher race did not affect self-concept. These two findings juxtapose one another in an interesting way. Though speculative, one way to think about these two results might be that although perceived stereotyping has a negative impact on blacks' self-concept, they enter school with higher self-concepts than whites. However, as blacks advance through school, their self-concept declines to a similar level as whites have, with perceived stereotyping contributing to this convergence. The panel analysis in Chapter 8 will shed light on this matter.

With the hypothesis regarding performance discounting rejected, we ask why racial mismatching does not influence the racial gap in ABAA? One possibility may be that the theory of performance discounting does not hold in real world. As mentioned, the empirical tests on attribution bias and discounting strategies have mostly been done in social psychology laboratory settings with small numbers of participants. Its external validity in real-world settings such as schools may be low.

There are other possibilities, however. Unmet assumptions and/or model misspecifications could cause a null finding. Two such scenarios will be discussed—both

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<sup>14</sup> See Table 6.8. Using test scores, the blacks' academic self-concept was 0.149 SD higher ( $p=0.03$ ) in black teacher classrooms than in white teacher classrooms ( $0.149 = 0.276 - 0.127$ ). [For the  $p$ -value of this contrast, see (3) vs (4) on OLS model side for the test score column in Table 6.8.] The pattern was largely the same for teacher's rating, with blacks in black teacher classrooms showing 0.094 SD higher ( $p=0.12$ ) level of academic self-concept than those in white teacher classrooms.

<sup>15</sup> See Table 6.8. For white teachers, black students' academic self-concept was 0.127 standard deviations (SD) higher than that of counterpart whites ( $p<0.01$ ) and, for black teachers, 0.164 standard deviations (SD) higher ( $p=0.13$ ) ( $0.164 = 0.276 - 0.112$ ). The pattern was somewhat similar with teacher's rating, blacks' academic self-concept was 0.130 SD higher ( $p<0.01$ ) in white teacher classrooms and 0.183 SD higher in black teacher classrooms ( $p=0.09$ ) among the average achievers. There were no such racial differences in the mean-level academic self-concept among the average achievers of parental rating. These patterns were largely repeated when fixing the school effects (i.e., FE model), with somewhat larger racial differences and higher statistical significances.

of which will be dealt with empirically later in the study. One is the potential violation of the assumption that perceived stereotyping varies according to racial mismatching. This is a key assumption to our racial mismatch hypothesis, and it presupposes that students have a well-developed racial identity and knowledge of racial stereotypes, which enables them to distinguish biased from realistic feedback. Although recent studies have suggested that children as young as ten years old can identify stereotyping (e.g., McKown & Strambler 2009), it is possible that many children in our sample of 3<sup>rd</sup> graders might have been simply too young. Under such a circumstance, our hypothesis testing would not have yielded a realistic result. This potential problem is directly addressed in the next chapter, which analyzes the same sample of children after they have grown older and reached 8<sup>th</sup> grade. At this age they are much more likely to have sufficient knowledge to discern between unbiased and biased feedback.

Another possibility for rejecting the hypothesis is that the influence of racial mismatching on performance discounting is not uniform but is contingent on the broader school context. For example, teacher race might be associated blacks' performance discounting, but only under certain compositional and/or organizational settings. The group threat perspective (e.g., Blumer 1958; Renzulli, Parrott, & Beattie 2011), for example, suggests that teacher prejudice and bias against minorities might depend not just on racial mismatching, but on the overall minority composition of the school. Additionally, some studies suggest that systematic teacher bias related to racial mismatching would be much less prevalent in schools with good climates (e.g., a communal climate) (e.g., Bryk, Lee, & Holland 1993). This possibility is directly addressed in the next section which analyzes the interaction between racial mismatching

and broad school context and its effect on performance discounting. Specifically examined are the potential moderating roles of school racial composition, SES composition, and climate on racial mismatch effects. Could racial mismatch be associated with performance discounting but only in racially-segregated schools? Could performance discounting vary according to racial mismatch, but only in schools with a certain climate? To better sort out these possibilities, the next section examines the moderating influence of school context on performance discounting and its racial disparity.

#### *School Racial Composition as a Moderator, 3<sup>rd</sup> Grade*

There are two theories that guide expectations of the moderating influence of school racial composition (indicated by the percentage of black students). Per the “token status” perspective (e.g., Kanter 1977), blacks are expected to perceive higher level of racial prejudice in situations when their race is more salient (e.g., when there are few black students in a classroom of whites). If so, it follows that blacks would perceive greater prejudice in schools that have a higher proportion of white students, *and* that the racial disparity in ABAA would be greater in predominantly white schools. On the other hand, as per the “group threat” perspective (e.g., Blumer 1958), prejudice from white teachers against blacks is expected to be greater in schools with a high percentage of black students, suggesting that in white-teacher classrooms, the racial disparity in ABAA would be greater in predominantly black schools. Thus, two competing hypotheses are suggested: according to token status, the racial gap in ABAA would be *greater* in schools that are predominantly *white* while, according to the group threat perspective, the racial

gap would be *smaller* in such schools. Similarly, the racial mismatch effect, which represents the difference in the racial gap in ABAA according to teacher race, is expected to be greater (according to token status) or smaller (according to the group threat perspective) in schools that are more predominantly white.

*Research Question 3.*

*Are the racial differences in ABAA influenced by the racial compositions of schools? Are blacks prone to discount performance more (or less) if they are in schools that are predominantly white, as opposed to black? Does teacher race matter more (or less) in terms of students' performance discounting if the schools are predominantly white?*

Table 6.9 shows the regression results. The model specification was same as that of the prior section, except for the inclusion of a three-way interaction between student-teacher race, achievement, and school % black, as the main predictor. For this analysis, school % black was standardized. To see whether school % black had a moderating influence on the racial gap in ABAA, the appropriate linear combination statistics were tested at one SD below the sample mean, at the sample mean, and at one SD above the sample mean of school % black . In all this, school SES composition and climate were statistically controlled for.

Within white-teacher classrooms, the racial gap in ABAA increased with increasing school % black. Blacks' ABAA in white-teacher classrooms was weaker in schools that were predominantly black. At the sample mean of school % black, the racial gap in the association between academic self-concept and test score was 0.174 SD ( $p < 0.01$ ), but, at one SD above the mean, the racial gap in ABAA was 0.247 SD ( $p < 0.01$ ) while at one SD below the mean it was just 0.100 SD ( $p = 0.137$ ).<sup>16</sup> These patterns were

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<sup>16</sup>  $-0.247 = -0.174 + (1)*(-0.074)$ ;  $-0.100 = -0.174 + (-1)*(-0.074)$

essentially the same for analyses of teacher ratings and parental ratings. Thus, for white-teacher classrooms, the result was consistent with the group threat perspective.

However, for black-teacher classrooms, the result failed to support any perspectives. Racial differences in ABAA appeared to decline as the school's population became more black, but because of large standard errors (likely owing to smaller sample size), there was no statistical significance in any of these tests. The results were largely similar for both teacher and parental ratings. Hence, for black-teacher classrooms, school's racial composition did not show moderating influences on performance discounting—or, at best, the result was inconclusive.

Finally, the racial gap in ABAA across teacher race, which represents the test statistics for the racial mismatch effect, was only minor. Blacks' weaker ABAA was not as weak in black-teacher classrooms as in white-teacher classrooms when schools were predominantly black (vs. white). For example, at one SD below the sample mean of school % black, blacks' ABAA was weaker in black-teacher classrooms than in white-teacher classrooms by 0.231 SD. However, at one SD above the mean, blacks' ABAA was *stronger*, in black-teacher classrooms than in white-teacher classrooms by 0.204 SD ( $p = 0.139$ )—the result of which is consistent with the racial mismatch hypothesis.

However, the statistical significance of these tests was low.

The findings in this section suggest that the racial composition of schools may moderate students' level of performance discounting. In white-teacher classrooms, the racial difference in ABAA was greater when schools were predominantly black. In black-teacher classrooms, the racial difference in ABAA did not significantly vary by schools' racial compositions—or at least the result was inconclusive due to large standard errors.

The result generally supports the group threat perspective, which predicts more heightened bias towards minorities by white teachers in more minority-concentrated schools. The finding also suggests a possibility in which the assumed effect of token status and oppositional culture on students' psychosocial outcomes (e.g., perceived racial stereotype) might not exist, or at best is weak, in white-teacher classrooms; for black-teacher classrooms, the said effect was hinted but not shown conclusively. To make sense of why the racially-integrated school setting might not intensify perceived bias against blacks in white-teacher classrooms, for example, one would perhaps have to think about the potential relationship between teacher race and some of the racial inequalities in achievement opportunities within schools. Whatever the case might be (such investigation is beyond the scope of this study), the findings here suggest a much more nuanced interplay between school composition and the dynamics of classroom racial mismatching.

#### *School SES Composition as a Moderator*

Racial stereotypes exist above and beyond class stereotypes and, as such, one would expect there to be an influence of schools' SES composition on performance discounting that is separate from the influence of racial composition. With that said, due in part to data limitations—namely, a small sample size of high-SES, predominantly black schools—disentangling the effects of racial and SES compositions on student outcomes has always been problematic. This study is no exception (see Table 6.12 for the sketch of the case coverage), and the results presented next should be interpreted with caution. As for the theoretical expectation of a moderating effect of SES composition,

there are two recent studies that offer competing predictions. In a study of the low-income U.S. high school students, Crosnoe (2009) found a significant interaction between student race and the SES composition of schools (holding racial composition constant) on students' psychosocial outcomes. In high-SES schools, low-income blacks (but not low-income whites) were vulnerable to perceiving social isolation and negative self-images. This would suggest, for this study's purposes, that blacks may feel greater racial bias in high-SES schools (vs. lower SES) and are more likely to discount their performance. Crosnoe's analysis, however, was limited to low-income students, and it is unclear how this process plays out for students of all income levels. On the other hand, Rumberger and Palady's study (2005) suggested something quite opposite. In their study of U.S. high school students, having found that the SES composition of schools, and not racial composition, was more important to student achievement, the authors showed that this effect was greater for blacks than for whites. They showed that the lower the school SES, the lower the student achievement, especially for blacks, and furthermore, they observed this negative effect was partly mediated by teacher expectations of student achievement. They showed that lower-SES schools had more negative teacher views of student achievement. Their finding suggests, then, for our purposes, that blacks may feel greater racial bias in lower-SES schools (vs. higher SES schools) and are thus more likely to discount their performance. These two studies offer opposing evidence for the influence of school SES composition on student performance discounting.

Table 6.10 shows the regression results. The key predictor in this regression was the three-way interaction between child-teacher race, achievement, and school % free lunch. School % free lunch is a continuous measure that represents the percentage of

students in a school who are eligible to receive a free lunch. The variable is presumed to inversely relate to school SES (i.e., a higher percentage indicates lower school SES). For this analysis, the variable was standardized. In running the regression, the racial composition of schools, and school climate, were statistically controlled for.

The moderating influence of SES composition was in the same direction for both white- and black-teacher classrooms. In both classrooms, the racial gap in ABAA was greater in schools with a lower % free lunches (i.e. higher SES schools). The result is consistent with Crosnoe (2009) and was present for all three achievement measures (test scores, teacher ratings, and parental ratings). For example, using test scores, within white-teacher classrooms, blacks' ABAA was weaker than that of whites by 0.192 SD ( $p < 0.01$ ) at moderate-SES schools. However, at low-SES schools (i.e. one SD below the sample mean), blacks' ABAA was weaker than whites' by 0.282 SD ( $p < 0.01$ ), while at high-SES schools (one SD above the sample mean) it was weaker by a lesser amount (0.103 SDs,  $p = 0.013$ ). Likewise, within black-teacher classrooms, blacks' ABAA was weaker than that of whites by 0.264 SD ( $p = 0.049$ ) at moderate-SES schools but in low-SES schools, blacks' ABAA was weaker by 0.421 SD ( $p = 0.045$ ), and at high-SES schools it was weaker by only 0.107 SD, which was insignificant ( $p = 0.318$ ). Therefore, there was little racial mismatch effect according to school SES. The size of the racial gap in ABAA was no different in white- and black-teacher classrooms.

#### *School Climate as a Moderator*

School climate represents the broader ethos and normative practices of schools that transcend the immediacy of individual classroom interactions (e.g., Brookover et al.

1978). This study expected school climate to moderate students' performance discounting above and beyond the influences of racial and SES composition. In the literature, school climate is discussed in the context of norms and practices surrounding multiple domains of schooling (Cohen, Michelli, & Pickeral 2009). As ECLS-K provided data on school climate pertaining to three domains—academics, discipline, and interpersonal relations—the analysis and discussion in this section are limited to these. In terms of academic climate, schools with a high climate are characterized by higher demands and expectations of student achievement, higher qualities of instruction, and closer parental involvement. Schools with high academic climate tend to eschew ability-grouping and incorporate more uniform curricula for all students (Lee & Smith 1999; Shouse 1996). In terms of disciplinary climate, high climate schools are characterized by more orderly, safe, and supportive environments, in which misbehavior and bullying are less tolerated and less frequent (Bodovski, Nahum-Shani, & Walsh 2013). In terms of social climate (interpersonal relationships), schools with high climates are characterized by higher levels of unity and school spirit among teachers, staff, and students, as well as a communal school organization with greater focus on the interpersonal relations of students and teachers (Bryk, Lee, & Holland 1993; Phillips 1997). For the purposes of this analysis, school climate is based on the three domains combined, rather than separately. Each domain has same valence (direction) and are highly correlated with one another; the internal consistency of this instrument, when representing the combined school climate, was high with a Cronbach alpha of 0.84.

How might school climate moderate students' performance discounting and its racial difference? On the one hand, high climates in each of the three domains suggest

learning environments that are more equitable, safe, and warm, which would lead us to believe that perceived racial bias by blacks would be lower, and the racial gap in performance discounting smaller, in higher climate schools. On the other hand, some studies suggest that not all students equally benefit from high climates. Rather, some can even be negatively influenced by not being able to keep up with the high standards of their schools, e.g., there may be a sense of alienation in low-achieving students in high academic climates, and a sense of unfair disciplinary treatment of minority children in high disciplinary climates, etc. (McDill, Natriello, & Pallas 1986; Haynes, Emmons, & Ben-Avie 1997). In the latter cases, one would expect black students' perceived bias and the racial gap in ABAA to be greater, not smaller, in schools with higher climates. Thus, the literature is inconclusive.

Table 6.11 shows the results of the regression on school climate. The moderating influence of school climate was in the same direction for both white- and black-teacher classrooms. In black-teacher classrooms, blacks' ABAA (using test scores) was weaker than that of whites by 0.12 SD ( $p = 0.21$ ) at moderate-climate schools but, in lower-climate schools it was weaker by 0.18 SD ( $p = 0.13$ ). In higher school climates it was only slightly weaker than that of whites' ABAA, but statistically insignificant (0.05 SD,  $p = 0.66$ ). In contrast, in white-teacher classrooms, blacks' ABAA was weaker by 0.09 SD ( $p < 0.01$ ) at low-climate schools, weaker by 0.14 SD at moderate-climate schools ( $p = 0.02$ ), and weaker by 0.19 SD at high-climate schools ( $p < 0.01$ ). Thus, in white-teacher classrooms, the racial gap in ABAA increased with increasing school climate, while in black-teacher classrooms the relationship was reversed. Combined, the racial mismatch effect was stronger the higher the school climate. This pattern was largely similar with

analyses using teacher and parental ratings. These results suggest a possibility that blacks who attend schools with high school climates might be subjected to a greater level of token status, and thereby perceive teacher's bias more strongly than they would have in low-climate schools. At the same time, students in black-teacher classrooms might enjoy the overall benefit of higher school climate without such a token status, thereby magnifying the racial mismatch effect. Whatever the case may be, the finding in this section suggests there is a moderating influence of school climate, although its mechanism may be more complex than hypothesized.

### *Conclusions*

The reasons for African-American students' relatively high level of academic self-concept have long puzzled researchers. One reason suggested by the literature is that African-American students tend to discount objective measures of achievement when constructing their self-beliefs about their own academic competence (e.g., Morgan & Mehta 2004; Cohen & Steele 2002). Such discounting, however, is thought to come at a cost. More and more research shows that realistic self-appraisal, not high self-appraisal, is optimal for achievement (e.g., Crocker 2006; Crocker & Park 2004). Performance discounting, therefore, presents a unique challenge for blacks' academic achievement. This chapter investigated racial disparity in performance discounting and its relation to student-teacher racial mismatch in a representative sample of 3<sup>rd</sup> grade U.S. elementary school students.

As expected, there was a large racial difference in ABAA in 3<sup>rd</sup> graders. Controlling for students' demographic, school context, and engagement/motivation

factors, blacks' ABAA was significantly weaker than that of whites. Blacks' ABAA, was some 30% weaker with respect to test score, 24% weaker with respect to teacher ratings, and 22% weaker with respect to parental ratings. As expected, these racial disparities were present even after controlling for factors related to social comparison and disidentification theory. Although these factors (school context and retention status) explained a substantial amount of the black-white disparity in mean academic self-concept, they did not explain as much of the disparity in the relationship between academic self-concept and achievement.

Surprisingly, the largest racial gap in ABAA was not evident from teacher ratings. Test scores exhibit the largest racial gap. As expected, the least racial disparity was shown with parental rating—albeit the size of disparity was greater than anticipated. These findings suggest that performance discounting might be contingent not just on perceived bias, but also on how informative it is and thereby how controvertible it would be discount it. As teacher ratings are more salient and easy to interpret (e.g., Wylie ), it may be that students find it less able to disregard them than, say, standardized test scores, which are more distant, and difficult to interpret. In addition, the finding on parental ratings suggests that blacks are not entirely devoid of perceiving bias, even from their own parents.

Contrary to this study's expectation, student-teacher racial mismatch failed to explain the racial disparity in ABAA. There was little difference in the size of the racial gap in ABAA between white- and black-teacher classrooms. Furthermore, even within black students, there was little difference in ABAA dependent on teacher race. These results were similar across the three achievement ratings (test scores, teacher, and

parental ratings). All in all, the racial mismatch hypothesis was rejected and performance discounting theory was not supported.

There were, however, some hints of moderating influences of broader school contexts on ABAA and its racial difference. For example, in schools that were predominantly black, or in schools with high climates, the racial gap in ABAA was smaller in black-teacher classrooms than in white-teacher ones (consistent with performance discounting theory), albeit the statistical significance was generally low in these tests. Within white-teacher classrooms, blacks' relative weakness in ABAA was greater in schools that were predominantly white, rich, or high-climate. Within black-teacher classrooms, blacks' relative weakness in ABAA was somewhat greater in schools that were predominantly black, rich, or low-climate, but the statistical significances were either lacking or low. These contrasting influences of teacher race suggest a more nuanced interplay between racial mismatching and school contexts in their impact on performance discounting than what this study had assumed. More intensive assessments of performance discounting theory that consider these broad school contexts are recommended in the future.

The large black-white disparity in ABAA demonstrated in this chapter is troubling for not only its size, but also the fact that it is present at such an early age—3<sup>rd</sup> grade. The racial difference in academic self-concept is greater among low-achieving students while being much smaller, or non-existent, among high achievers. Why do low-achieving blacks have higher academic self-concepts than their low-achieving white counterparts, while among high-achievers there is little to no racial difference? There appears to be some type of selective attribution mechanism at work that makes blacks, especially if

they are underachieving, more likely to reject their poor performance. Surprisingly though, in contrast to the key thesis of this study, racial mismatch did not relate to this mechanism.

It is conceivable that the theory of performance discounting does not apply well to real school and classroom settings. However, it is also possible that some key assumptions of this theory were not empirically met. One such assumption is the notion that young children, as young as ten years old, are old enough to perceive racial bias. The next chapter addresses this assumption by analyzing the same group of children when they reach 8<sup>th</sup> grade. The next chapter replicates the analyses of this chapter to examine how the racial differences in academic self-concept for this group of children change once they reach 8<sup>th</sup> grade. Does the racial disparity in ABAA continue to exist in middle school as it did in elementary school? Is the disparity more pronounced or reduced in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade? Does racial mismatching explain the racial disparity in ABAA? Is there evidence of moderating influences of school context in 8<sup>th</sup> grade, and, if so, how do they compare to what were shown in 3<sup>rd</sup> grade?

**CHAPTER 7**  
**EMPIRICAL ANALYSIS II:**  
**RACIAL DISPARITY IN THE RELATIONSHIP BETWEEN 8<sup>th</sup> GRADERS’**  
**ACADEMIC SELF-CONCEPT & ACHIEVEMENT**

This chapter examines racial disparity in performance discounting in 8<sup>th</sup> graders. As was the case in the last chapter, this chapter’s primary purpose is to situate the psychological theory of performance discounting under a broader institutional environment of schools, and test whether the racial disparity in performance discounting is structurally patterned in terms of the racial matching of teachers and students. However, this chapter focuses on 8<sup>th</sup> graders rather than 3<sup>rd</sup> graders. Specifically, I test the hypothesis that, for the representative sample of the U.S. 8<sup>th</sup> graders, the association between academic self-concept and achievement is weaker for blacks than for whites, and that this racial disparity in ABAA is greater in white-teacher classrooms than in black-teacher classrooms.

The set of assumptions and hypotheses are identical to those applied to 3<sup>rd</sup> graders (Chapter 6) except that 8<sup>th</sup> graders are expected to perceive racial stereotypes and bias more acutely than they did in 3<sup>rd</sup> grade (e.g., McKown & Weinstein 2003; McKown & Strambler 2009). A body of literature shows that most children are knowledgeable of racial stereotypes by middle school, if not earlier (Hudley and Graham 2001; Rowley, Kurtz-Costes, Mistry, & Feagans 2007; Okeke, Kurtz-Costes, & Rowley 2009). Therefore, it is expected that the racial disparity in performance discounting, as well as its relation to racial mismatching, would both be greater in 8<sup>th</sup> graders than in 3<sup>rd</sup> graders. One thing

clear from prior studies is that academic self-concept tends to be lower (e.g., Eccles et al 1993) and its correlation with academic outcomes stronger for students in middle school than in elementary school (Harter 1999; Stipek & MacIver 1989). This is expected to be confirmed in this chapter, despite the relative racial differences that persist over time.

The organization of the chapter follows that of the 3<sup>rd</sup> grade chapter (Chapter 6). First, ABAA is described within a univariate framework. Then, the relationship is examined in a multivariate framework, highlighting racial disparity while controlling for various correlates, including broad school contexts and retention status. The inclusion of broad school contexts and retention status as controls is designed to show that racial disparity in performance discounting is not entirely attributable to factors pertaining to two traditional theories—social comparison and disidentification. Thereby, performance discounting strategy, as a possible influence on the ABAA racial gap, is highlighted. Finally, the performance discounting theory is tested by examining the relationship between student-teacher racial matching in classrooms and racial disparity in ABAA. These tests are conducted across different types of achievement measures and school contexts.

This chapter continues to employ the labeling convention used in the previous chapter. The phrase “association (or relationship) between academic self-concept and achievement” is shortened to “ABAA”. The phrase “student-teacher racial mismatch” is referred to as “racial mismatch”. All mentions of academic self-concept and achievement (IRT, teacher’s rating, parental rating) always refer to English/reading academic self-concept and English/reading achievement, respectively, unless otherwise stated.

## DESCRIPTIVE FINDINGS

### *Racial Differences in Academic Self-Concept, 8<sup>th</sup> Grade*

Students in 8<sup>th</sup> grade rated themselves from 1 to 4 (from lowest to highest) on questions about their own academic abilities in English/reading subjects. On average, students rated themselves less optimistically than they did in 3<sup>rd</sup> grade. Table 7.3 shows that whites rated themselves (mean score  $\pm$  SD) as  $2.82 \pm 0.02$ , while blacks scored  $2.74 \pm 0.03$ . The difference was not statistically significant. These figures reflect a decline from the levels reported in 3<sup>rd</sup> grade, which were  $3.23 \pm 0.02$  for whites and  $3.26 \pm 0.02$  for blacks. Such a decline is consistent with the literature, which shows that young children's inflated academic self-views typically decline to a more moderate level as they transition from elementary to middle school (Stipek & McIver 1989; Harter 1999).

Although there was little difference in the overall mean academic self-concept between blacks and whites, such was not the case when achievement levels were controlled for. Table 7.3 shows that among low achievers (i.e., with achievement scores one SD below the mean), blacks' academic self-concept was higher than that of whites'. For example, among the low test scorers, blacks' academic self-concept was  $2.57 \pm 0.08$ , while whites' was  $2.38 \pm 0.06$ . The difference was statistically significant ( $p < 0.05$ ). However, among the mid and high achievers, the racial differences were not as sizable and were insignificant. It should be noted that the sample size of high achieving blacks was relatively small and the scores were more widely dispersed.

This pattern of selective racial difference (by achievement) in mean academic self-concept replicates the pattern observed in 3<sup>rd</sup> graders, except for one difference. In 3<sup>rd</sup> graders, a racial difference in academic self-concept was present among both low and

mid achievers; however, in 8<sup>th</sup> grade there was no difference among mid achievers. This suggests that the academic self-concepts of blacks and whites had converged across more levels of achievement, but, at the same time, racial differences in low achievers became more salient.

*Racial Differences in the Bivariate Correlations between Academic Self-Concept and Achievement, 8<sup>th</sup> Grade*

Table 7.4 presents the bivariate correlations between academic self-concept and achievement, representing the direction and size of the linear relationship between the two variables. As expected, blacks showed a weaker correlation between academic self-concept and achievement than did whites in 8<sup>th</sup> grade. This was true across the achievement measures: 0.37 vs. 0.17,  $p < 0.05$  for test scores of blacks vs. whites; 0.48 vs. 0.34,  $p < 0.05$  for teacher rating; 0.35 vs. 0.18,  $p < 0.05$  for parental rating.

Also consistent with the literature, the correlations were generally stronger in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade, for both blacks and whites. With teacher ratings, the size of the correlation between academic self-concept and achievement increased from 0.32 (3<sup>rd</sup> grade) to 0.48 (8<sup>th</sup> grade) for whites, and from 0.24 (3<sup>rd</sup> grade) to 0.34 (8<sup>th</sup> grade) for blacks. With test scores, there was a slight increase for whites from 0.34 (3<sup>rd</sup> grade) to 0.37 (8<sup>th</sup> grade) but a slight decrease for blacks from 0.20 (3<sup>rd</sup> grade) to 0.17 (8<sup>th</sup> grade) for blacks. With parental ratings, both whites and blacks showed modest increases.

*Social Comparison & Disidentification, 8<sup>th</sup> Grade*

Traditionally, racial differences in academic self-concept have been explained and discussed in terms of social comparison (e.g., blacks tend to compare themselves to other blacks rather than to whites) and disidentification (e.g., academically “disidentified” students are more likely to report academic self-concepts that are dissociated from their achievement). Table 7.5 shows how the factors pertaining to these two perspectives relate to the individual differences in the bivariate correlations between academic self-concept and achievement. The social comparison perspective was represented by three factors: school racial composition, school SES composition, and school climate. Unlike in 3<sup>rd</sup> grade, the disidentification perspective was only represented by retention status as the ECLS-K survey did not collect information on absence and tardiness in 8<sup>th</sup> grade as it did in 3<sup>rd</sup> grade. It should be noted that absence and tardiness had little influence in any of the 3<sup>rd</sup> grade analyses. Most significant influences were related to retention status.]

As was the case in 3<sup>rd</sup> grade, ABAA was significantly weaker for students in schools with a top quartile percentage of blacks (i.e., “more black”), a top-quartile percentage of poor (“more poor”), and a bottom quartile school climate (“low climate”). For example, the correlation between academic self-concept and test scores for students in “more black” schools (i.e., a top quartile percentage of blacks) was 0.18 ( $p < 0.05$ ), while in “more white” schools (i.e., a bottom quartile percentage of blacks) it was 0.39 ( $p < 0.05$ ). Likewise, the correlation between academic self-concept and test scores for students in more poor schools was 0.18 ( $p < 0.05$ ), while in more rich schools it was 0.36 ( $p < 0.05$ ). Too, the correlation between academic self-concept and test score was lower in low-climate schools (0.21,  $p < 0.05$ ) than in high-climate schools (0.32,  $p < 0.05$ )—albeit, for teacher rating and parental rating, there were no correlational differences by

school climate. Moreover, students who had been held back a grade generally showed lower correlations between academic self-concept and achievement than those who had never been held back. Since each of these factors was also shown to be associated with race (see bottom row, Table 7.5), controlling for these factors better isolates performance discounting strategy as a possible contributing factor to racial disparity in ABAA. Is there a black-white difference in ABAA if all students went to a similar type of schools? I discuss next the results of the multivariate analysis.

## MULTIVARIATE ANALYSIS

### *Racial Disparity in ABAA, 8<sup>th</sup> Grade*

Table 7.6 shows the multiple regression of academic self-concept on race, test score, their two-way interaction, and covariates. Like in 3<sup>rd</sup> grade, several different modeling strategies were used,<sup>17</sup> and in the end, OLS regression with robust standard error (adjusted for clustering), was chosen as the best model. Both academic self-concept and achievement variables were standardized for the purpose of comparing regression coefficients across the models.<sup>18</sup> The results are discussed in terms of the original research questions.

### *Is there a racial difference in ABAA in the 8<sup>th</sup> grade?*

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<sup>17</sup> This study settled on the OLS robust standard error model because 1) Tobit model estimates showed that the ceiling effect was minimal; 2) the data structure was such that the gain in efficiency of a random effect model would be minimal (low number of students per school); 2) the need to examine between-school effects precluded a fixed effect model in many analyses. The results were generally similar across different strategies.

<sup>18</sup> Models were also run using non-standardized variables, and the results were essentially identical except the inflated t-statistics for the intercept in the non-standardized version.

The OLS model was estimated in a sequential manner with blocks of covariates. Model 1 (unconditional model) shows that the association between academic self-concept and test scores was significantly lower for blacks than for whites. For whites, a 1 SD increase in test score was associated with a 0.384 SD ( $p < 0.05$ ) increase in academic self-concept. Meanwhile, for blacks, there was only a 0.173 SD ( $p < 0.05$ ) increase. Blacks' ABAA was some 55% weaker than that of the counterpart whites. Model 2 accounted for the basic demographic characteristics of the students (sex, parental socioeconomic status, and child's kindergarten test scores), and the patterns remained largely unchanged. Model 3 accounted for the factors pertaining to social comparison and disidentification (school % black, school % free lunch eligible, school climate, and student retention status), and it shows that these factors greatly reduced the racial differences in academic self-concept—among average test scorers it went from 0.183 SD (Model 2) to just 0.080 SD (Model 3), an difference of more than 56%. At the same time, these factors explained very little of the racial differences in ABAA, which went from 0.194 SD in Model 2 to just 0.175 SD in Model 3, a change of just 10%.<sup>19</sup> Even with the two popular explanations for racial differences in academic self-concept, blacks' ABAA was still 57% weaker than that of whites. This result is consistent with our expectation that ABAA is weaker for blacks than for whites, even after accounting for factors pertaining to social comparison and disidentification.

*Does the racial difference in ABAA vary by the type of achievement measure (e.g., test scores, teacher ratings, parental ratings)?*

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<sup>19</sup> Note that the coefficient for achievement remained fairly stable from model 2 to model 3: from 0.308 to 0.306.

Table 7.7 compares the results across the three achievement measures for the OLS and the fixed effect model. This study's expectation was that, of the three achievement ratings, teacher ratings would show the largest racial disparity in ABAA—based on the assumption that students would perceive higher levels of bias from teacher ratings than from any other performance evaluation. Table 7.7 shows that this expectation was not met. Contrary to our expectation but consistent with the 3<sup>rd</sup> grade result, teacher ratings did not show the largest racial disparity in ABAA in 8<sup>th</sup> grade (31% weaker ABAA for blacks); instead, like in 3<sup>rd</sup> grade, the largest racial disparity in ABAA was shown with test scores (57% weaker ABAA for blacks). This result further corroborates the speculation raised in the last chapter that students may have more difficulty disregarding teacher ratings than they would other academic evaluations. As mentioned, teacher ratings come from teachers' communication in daily classroom interactions, as well as from letter grades in assignments and report cards, while test scores represents an evaluation akin to school-administered standardized tests, which are given less frequently, are impersonal, and provide a less clear benchmark of comparison. For these reasons, it is conceivable that, even with the high level of perceived bias associated with teacher ratings, students might find it difficult to disregard them because it is perhaps relatively more informative and substantive than other feedback. Incidentally, analysis of parental ratings resulted in the second-largest racial gap in ABAA, of 56%. The finding strongly suggests that blacks might be inclined to discount parental beliefs just as easily, if not more so, as they would any other performance evaluations.

*For all students, is ABAA generally stronger in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade? Does the racial difference remain nonetheless?*

For all students, there was a sharp increase in the strength of the association between academic self-concept and teacher ratings from 3<sup>rd</sup> to 8<sup>th</sup> grade (see Tables 7.7 and 6.7). Among average-achieving whites, the association between academic self-concept and teacher ratings increased from 0.305 ( $p < 0.05$ ) in 3<sup>rd</sup> grade to 0.435 ( $p < 0.05$ ) in 8<sup>th</sup> grade and, among average-achieving blacks, from 0.233 ( $p < 0.05$ ) in 3<sup>rd</sup> grade to 0.299 ( $p < 0.05$ ) in 8<sup>th</sup> grade. This finding is consistent with the literature, which predicts students' academic self-concepts to become more indicative of their academic achievement as they advance in school. Surprisingly, though, the same kind of increase was not shown with respect to test scores. Among the average test-scorers, ABAA for whites declined from 0.376 in 3<sup>rd</sup> grade to 0.306 in 8<sup>th</sup>, and for blacks, from 0.263 in 3<sup>rd</sup> grade to 0.131 in 8<sup>th</sup> grade. This surprising result is somewhat reflective of the weakening relationship between test scores and teacher ratings—the weakening of which was hinted at in the figures for the bivariate correlations (e.g., compare Table 7.4 vs. Table 6.4)—while, at the same time, teacher ratings become relatively more influential to students' academic self-concept (e.g., again, compare the correlations in Tables 7.4 and 6.4) One reason for the weakening relationship between test scores and teacher ratings may be that students' academic performances are spreading out more widely and becoming more finely differentiated, while at the same time, teacher ratings are unable to capture such differentiation beyond the letter grades;<sup>20</sup> all the while, teacher's academic evaluations are becoming increasingly more influential to children's academic self-views (e.g.,

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<sup>20</sup> That is, not all "A"'s are the same, not all "F"'s are the same. Whereas test scores can distinguish students by finer achievement levels, teacher's rating must lump together many children, especially at the extreme ends of the achievement levels.

Spinath & Spinath 2005). Consequently, it appears that students' academic self-concept becomes more strongly related to academic achievement for some achievement measures (e.g., teacher ratings) but not others (e.g., test scores).

In terms of the change in racial differences in ABAA over time, our expectation was that the racial gap in ABAA would be bigger in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade because students' perception of racial bias would be higher in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade. This expectation was met. In 3<sup>rd</sup> grade, with test scores, blacks' ABAA was 30% weaker than that of whites but, in 8<sup>th</sup> grade, more than 56% weaker. Likewise, with teacher ratings, blacks' ABAA was 24% weaker in 3<sup>rd</sup> grade but more than 31% weaker in 8<sup>th</sup> grade. The finding suggests that the relative weakness of blacks' ABAA grew bigger even as the overall trend of ABAA strengthened for teacher ratings and weakened for test scores.

In sum, there is a sizable difference in ABAA between blacks and whites in 8<sup>th</sup> grade. Even after accounting for the factors pertaining to two popular explanations for racial difference in academic self-concept, blacks' ABAA was substantially weaker than that of whites. Furthermore, in comparison to 3<sup>rd</sup> grade, ABAA appears to have become stronger and its racial gap bigger. The question is, what explains this racial disparity in performance discounting? I turn next to examining and discussing student-teacher racial mismatch as a structural determinant of racial disparity in ABAA.

#### *Racial Mismatch and Racial Disparity in ABAA, 8<sup>th</sup> Grade*

This study's central hypothesis is that blacks' weaker ABAA is partly determined by the racial matching of teachers and students. This study assumed, based on the literature, that there are racially-based variations in teachers' bias towards students'

abilities, and that students are able to perceive this. Specifically, it was assumed that blacks in white-teacher classrooms are more likely to perceive this bias than blacks in black-teacher classrooms, while whites never experience it (e.g., McGrady & Reynolds 2013; Bates & Glick 2013). Moreover, unlike in 3<sup>rd</sup> grade, when children might have been too young to perceive teachers' bias, students in 8<sup>th</sup> grade may be more capable of recognizing it (Okeke, Howard, & Kurtz-Costes 2009; McKown & Strambler 2009). Based on these assumptions, the hypothesis that racial disparity in ABAA is greater in white-teacher classrooms than in ones with black teachers is tested.

*Is the racial disparity in ABAA greater in white-teacher classrooms than in black-teacher classrooms?*

Table 7.8 shows the results of the regression designed to answer this question. The dependent variable is academic self-concept and the key predictors are student-teacher race, achievement, and its two-way interaction. The regression model is same as that of the last chapter. The variable for student-teacher race is a four category nominal variable based on the possible combinations of student race and teacher race: 1) white-white, 2) white-black, 3) black-white, and 4) black-black. "White-black" indicates a white student in a black teacher classroom while "black-white" indicates a black student in a white teacher classroom.<sup>21</sup> For the regression analysis, I converted this nominal variable into dummy variables, with "white-white" as the reference category. The two-way interaction of student-teacher race and achievement was created by multiplying student-teacher race and achievement as follows: 1) white-white\*ach, 2) white-black\*ach, 3) black-white\*ach,

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<sup>21</sup> Of the total 6,145 students in 8<sup>th</sup> grade, there were 5,049 white students with white teachers (white-white), 163 white students with black teachers (white-black), 618 black students with white teachers (black-white), and 315 black students with black teachers (black-black).

and 4) black-black\*ach. The covariates for the regression included teacher experience and teacher education, in addition to all the covariates of the prior model, including sex, family SES, kindergarten test scores, school % blacks, school % free lunch, school climate, and retention status.

To see whether student-teacher racial mismatch was associated with racial disparity in ABAA, the latter was assessed in white- and black-teacher classrooms and then compared. For a more detailed description of the procedure, readers can review the last chapter, as the steps are identical. In white-teacher classrooms,<sup>22</sup> the racial gap in ABAA was 0.146 SD ( $p < 0.01$ ) according to test scores, and 0.097 SD ( $p = 0.01$ ) according to teacher ratings, and 0.135 SD ( $p < 0.01$ ) for parental ratings. In black-teacher classrooms<sup>23</sup>, the racial disparity in ABAA was 0.249 SD ( $p = 0.02$ ) for test scores<sup>24</sup>, 0.312 SD ( $p < 0.01$ ) for teacher ratings, and 0.087 SD ( $p = 0.42$ ) for parental ratings. In both classrooms, blacks' ABAA was weaker than that of whites; however, contrary to our expectation, the size of the racial difference in ABAA was not greater in white-teacher classrooms than in black-teacher classrooms. The formal test statistic for this difference was not statistically significant, suggesting that blacks' relatively excessive discounting of performance was neither greater nor less in white-teacher classrooms than in black-teacher classrooms. Thus, in 8<sup>th</sup> grade, like in 3<sup>rd</sup> grade, the hypothesis based on performance discounting theory was rejected.

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<sup>22</sup> These results are shown in the table by the contrast: "White-White\*Ach" vs. "Black-White\*Ach". Note that "White-White\*Ach" and "Black-White\*Ach" are the categories of the two-way interaction between the child-teacher race and achievement. The p-value for this contrast is shown next to "(a) vs (c)" under the test score column.

<sup>23</sup> These results are shown in the table by the contrast: "White-Black\*Ach" vs. "Black-Black\*Ach". The p-value for this contrast is shown next to "(b) vs (d)" under the test score column.

<sup>24</sup>  $-0.249 = -0.212 - 0.037$

Furthermore, even among just black students, there were no significant differences in the size of ABAA according to teacher race. Using test scores, the difference in ABAA between black-white classrooms and black-black classrooms was negligible (0.06,  $p = 0.33$ ).<sup>25</sup> The result was similar when using teacher ratings (0.10,  $p = 0.20$ ).

All in all, our test in this section suggests that student-teacher racial mismatch is not significantly related to blacks' performance discounting in 8<sup>th</sup> grade. The theory of performance discounting strategy was not supported. This rejected hypothesis follows the last chapter's similar result, further casting doubt as to whether the theory of performance discounting can hold up, or is applicable beyond the social psychological test settings. In the 3<sup>rd</sup> grade analysis, students' younger ages were speculated as a possible reason for the rejected hypothesis. However, this chapter ruled out this possibility, as the literature has strongly established that most children should be able to perceive racial bias by age 15 (or by 8<sup>th</sup> grade). Our findings in the last two chapters appear to suggest that perceived stereotyping is rather inconsequential in students' performance discounting, or at least, not related to racial matching in the way that was presumed.

Before discussing and/or speculating on what might be the true factors influencing racial disparity in ABAA, the possibility of some contingent effects of broader school contexts on the hypothesis testing should be considered first. In the last chapter, there were some hints that school composition and school climate were moderating racial mismatch effects. This possibility is examined again for 8<sup>th</sup> graders to see if the performance discounting theory can be met, contingent on the specific levels of

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<sup>25</sup> From the table,  $-0.097 - (-0.118) = 0.021$ . The p-value is shown next to "(c) vs (d)" under the column for test-score: 0.74.

broader school contexts. The results are also compared with the last chapter's, to see if some of these contingent effects of school context apparent in 3<sup>rd</sup> grade remain in 8<sup>th</sup> grade. As was the case in last chapter, three variables representing the broad school context are used for these analyses: school racial composition, school SES composition, and school climate.

### *School Racial Composition as a Moderator, 8<sup>th</sup> Grade*

As student-teacher interactions do not occur in vacuum but in a specific context, this study expects the racial disparity in ABAA and its relation to student-teacher racial mismatch to vary across different school contexts. The rationale for the specific direction and size of the moderating influence of school context remains identical to that which was described in the last chapter. The method used for testing these interactions also remains the same as the last chapter.

There are a few theories that guide expectations of a moderating influence of school racial composition—which, in this study, is measured as the percentage of black students. Per “token status” perspective (e.g., Kanter 1977), blacks are expected to perceive a higher level of racial bias in schools with high percentage of white students (e.g., integrated schools) than in predominantly black schools. Specifically, the racial disparity in ABAA and the racial mismatch effects are expected to be greater in schools with a higher percentage of white students. On the other hand, according to the “group threat” perspective (e.g., Blumer 1958), stereotypical attitudes of white teachers against blacks are expected to be greater in schools that are more segregated than integrated. From this perspective, the racial disparity in ABAA and racial mismatch effects are

expected to be greater in schools with a high percentage of black students. Hence, there are two competing hypotheses on the moderating influences of school racial composition.

In the 3<sup>rd</sup> grade analysis, the test results was more in line with the group threat perspective. In white-teacher classrooms, the racial disparity in ABAA was greater when schools were predominantly black; but, in black-teacher classrooms, the racial disparity in ABAA did not differ across school racial composition. Combined, the racial mismatch effect was greater and the theory of performance discounting more likely to be met in predominantly black schools. The results pointed to a nuanced interplay between school composition and racial mismatch.

In 8<sup>th</sup> grade, the test results were similar (Table 7.9). For white-teacher classrooms, like in 3<sup>rd</sup> grade, the racial disparity in ABAA was greater when schools were predominantly black; but, for black-teacher classrooms, the racial disparity of ABAA was not significantly different across school racial composition. Unlike in 3<sup>rd</sup> grade, however, this pattern was evident in analyses of test scores only, not for teacher ratings. With teacher ratings, school racial composition was largely inconsequential for both races of teacher. In terms of the racial mismatch effect, performance discounting theory was somewhat more likely to have been met in predominantly black schools, but the result was less conclusive than in 3<sup>rd</sup> grade due to low statistical significances. In schools with a high percentage of black students (one SD above the mean), in white-teacher classrooms, blacks' ABAA was weaker than that of whites by 0.15 SD ( $p < 0.01$ ) while, in black-teacher classrooms, not statistically significantly weaker than that of whites (0.08,  $p = 0.51$ ). However, in low % black schools (one SD *below* the mean), blacks' ABAA was not statistically significantly weaker than that of whites in either white-teacher

classrooms ( $0.09, p = 0.238$ ) or in black-teacher classrooms ( $-0.19, p = 0.48$ ). Thus, the difference in the racial disparity in ABAA across teacher's race was somewhat more positive (i.e., in line with the theory) in schools with a higher percentage of black students. The pattern was similar with teacher ratings but with smaller magnitudes.

The findings, in conjunction with the 3<sup>rd</sup> grade results, indicate that ABAA is determined by a complex interaction between classroom racial composition and racial mismatching. One result that was consistent across both grade levels was the relative weakness of blacks' ABAA (vs. whites' ABAA) that was greater in predominantly black schools with white teachers. This finding is consistent with the literature on group threat perspective. The theory based on token status and oppositional culture was not supported—albeit black teacher classrooms' patterns were suggestive of the theory, but with no statistical significances (likely due to power issues). All in all, though the exact mechanism behind these relationships is beyond the scope of this study, there is enough evidence present at both grade levels to at least suggest that school racial composition interacts with racial mismatch to exert some moderating influence on the racial gap in performance discounting.

#### *School Socioeconomic Status Composition as a Moderator, 8<sup>th</sup> Grade*

Socioeconomic (SES) composition of schools—indicated by the percentage of students eligible for free lunches—was expected to have a moderating influence on the racial disparity in performance discounting, above and beyond the influences from racial composition. Even though the racial and SES compositions of schools are highly correlated, one would anticipate the moderating influence of SES composition be distinct,

as racial stereotypes are distinct from class stereotype (Massey & Denton 1993). In terms of the specific direction and the size of the moderating influence, there is little guidance from the literature. Some research points to higher-SES schools having a negative effect on black performance discounting (Crosnoe 2009), while some other studies report an opposite effect (Rumberger & Palardy 2005). In our own 3<sup>rd</sup> grade analysis in the last chapter, blacks' performance discounting was greater in high-SES schools, in both white- and black-teacher classrooms. But, because there was little difference in the relative magnitudes of these racial disparities according to teacher race, the performance discounting theory was invalid in 3<sup>rd</sup> grade; this was true across all levels of SES composition.

In 8<sup>th</sup> grade (Table 7.10), like in 3<sup>rd</sup> grade, the racial disparity in ABAA was greater in schools with a large percentage of high-SES students, in both white- and black-teacher classrooms. However, like in 3<sup>rd</sup> grade, across the varying levels of SES composition (i.e., one SD above and below the sample mean), the racial gap in ABAA was still no smaller in black-teacher classrooms than in white-teacher classrooms, thereby showing no support for the performance discounting theory. Thus, in both grade levels, high SES composition was associated with greater performance discounting by blacks. At the same time, in both grade levels, the hypothesis for the racial mismatch effect was not met at any level of SES composition. A notable difference between the results of 3<sup>rd</sup> and 8<sup>th</sup> graders was the much-reduced size of the moderating influence shown in white-teacher classrooms, as well as the increased overall size of the racial disparity in ABAA in black-teacher classrooms for 8<sup>th</sup> graders (vs. 3<sup>rd</sup> graders). In white-teacher classrooms, the racial disparity in ABAA was relatively constant across SES compositions in 8<sup>th</sup> grade

than in 3<sup>rd</sup> grade, while, in black-teacher classrooms, the size of the racial disparity in ABAA was, overall, larger in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade, for all levels of SES composition.

*School Climate as a Moderator, 8<sup>th</sup> Grade*

“School climate” represents a school’s broader ethos and set of norms that transcends individual classroom interactions (e.g., Brookover et al. 1978). As such, stereotype vulnerability perceived in classrooms due to student-teacher racial mismatch is expected to vary according to school climate. As described before, high-climate schools have an ethos and norms that expect high achievement from *all* students (e.g., less tracking, uniform curriculum, etc.; Lee & Smith 1999; Shouse 1996). This would be conducive to mitigating perceived stereotype vulnerability in classrooms. Likewise, schools with high climates are likely to be characterized by orderliness and discipline (Bodovski, Nahum-Shani, & Walsh 2013), which would soften the intensity of perceived stereotype vulnerability. Similarly, schools with higher climates carry a greater sense of community, school spirit, and cooperativeness among students, teachers, and staff, all of which can contribute to greater interpersonal bonds among school members (Bryk, Lee, & Holland 1993; Phillips 1997). This too, can mitigate perceived stereotype vulnerability in classrooms. If such is the case, then one would expect the racial disparity in performance discounting and the racial mismatch effect to both be greater (or more evident) in low-climate schools. However, not all studies point to such an argument. Some contend, for example, that the process by which schools realize a high climate can have alienating effects on some groups of students, in particular, underachieving racial minorities (McDill et al. 1986; Haynes, Emmons, & Ben-Avie 1997). If such is the case,

it is possible that the racial gap in performance discounting and the racial mismatch effect are greater in high-climate schools. Thus, there are competing expectations for the test results.

Table 7.11 shows the results of the test. The racial disparity in ABAA was greater in low-climate schools, for both white- and black-teacher 8<sup>th</sup> grade classrooms. This was true for analyses of both test scores and teacher ratings.<sup>26</sup> In white teacher classrooms, using teacher's rating, blacks' ABAA was weaker than that of whites by 0.15 SD ( $p = 0.01$ ) in low-climate schools while no racial disparity (0.01 SD,  $p = 0.89$ ) in high-climate schools. Likewise, in black teacher classrooms, the relative weakness of blacks' ABAA was considerably greater in low-climate schools (0.40 SD,  $p=0.02$ ) than in high-climate schools (0.13 SD,  $p=0.39$ ). The result is comparable to the mixed findings in 3<sup>rd</sup> grade, in which the racial disparity in ABAA was greater in low-climate schools, but only in black-teacher classrooms. In terms of the racial mismatch effect, unlike in 3<sup>rd</sup> grade when there was a positive racial mismatch effect in high-climate schools (i.e., consistent with performance discounting theory), there was no such evidence across the spectrum of school climates in 8<sup>th</sup> grade. At all levels of school climate, there was no significant difference in racial performance discounting according to teacher race.

The smaller racial difference in performance discounting in high-climate schools—evident in both 3<sup>rd</sup> and 8<sup>th</sup> grades—is consistent with the literature, which suggests that blacks' perceptions of racial bias may be lower in schools with higher academic, disciplinary, and social climates. However, student-teacher racial mismatches

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<sup>26</sup> For example, in white teacher classrooms, using teacher's rating, blacks' ABAA was weaker than that of whites by 0.15 SD ( $p=0.01$ ) in lower school climate (i.e., schools with the climate that was one standard deviation below the sample mean) while no racial disparity (0.01 SD,  $p=0.89$ ) was shown in higher school climate schools (i.e., schools with the climate that was one standard deviation above the mean). Likewise, in black teacher classrooms, the relative weakness of blacks' ABAA was considerably greater in lower school climate (0.40 SD,  $p=0.02$ ) than in higher school climate (0.13 SD,  $p=0.39$ ).

were not related to significant variations in racial disparity in ABAA according to school climate. This suggests that school climate does not moderate the racial mismatch effect on performance discounting.

### *Conclusions*

As children grow older, their self-concepts become increasingly reflective of the viewpoints of others. They become more adept at seeing themselves with the eyes of others through the process of reflected appraisal (cf. Mead; Cooley, Gecas). Academic self-concept, which is a small subset of self-concept, is no exception to this rule. The literature shows that academic self-concept becomes increasingly realistic as children grow older, in the sense that children's beliefs about their own academic competence become more and more indicative of their actual academic performances.

Consistent with the literature, the analysis in this chapter shows that students' academic self-concepts declined from 3<sup>rd</sup> to 8<sup>th</sup> grade, while the ABAA grew stronger between the two periods. The finding reflects the less exuberant yet more realistic self-images of 8<sup>th</sup> graders compared with 3<sup>rd</sup> graders. However, such overall changes did not translate into a narrowing of the racial gap in ABAA. Blacks' weaker ABAA, in comparison to that of whites, not only persisted but grew even worse than in 3<sup>rd</sup> graders. For test scores, blacks' ABAA in 8<sup>th</sup> grade was some 57% weaker than that of whites, in comparison to being only 30% weaker in 3<sup>rd</sup> grade. For teacher ratings, blacks' ABAA was some 31% weaker than that of whites in 8<sup>th</sup> grade, in comparison to 24% weaker in 3<sup>rd</sup> grade. These racial gaps were demonstrated while controlling for student demography, broader school contexts, and retention status.

The racial disparity in ABAA varied according to the type of achievement rating, with a larger disparity shown for test scores than for teacher ratings. This finding was contrary to our general expectation but consistent with the last chapter's result for 3<sup>rd</sup> graders. The finding corroborates a speculation raised in the last chapter that the extent to which students discount performance may depend not just on the level of perceived racial bias attached to a performance rating, but also on how informative the rating is and how controvertible it would be to disregard it. It suggests that students may have more difficulty disregarding teacher ratings than other ratings, because they represent a type of academic evaluation that is perhaps the most direct and salient, and the easiest to interpret (e.g., Wiley 1979; ).

As was the case in with the 3<sup>rd</sup> grade analysis (Chapter 5), this chapter failed to find support for the theory of performance discounting strategy. The analysis revealed that racial mismatch does not explain the racial disparity in ABAA. In 8<sup>th</sup> grade, blacks' relative weakness in ABAA was similarly present in both white- and black-teacher classrooms. Given that one possibility for the rejected hypothesis of Chapter 5 was the young age of the respondents, this chapter's finding, based on older children, reinforces the idea that performance discounting theory is not applicable outside of social-psychological lab settings.

With that said, there are possibilities of model misspecifications and/or violations of premises that could nullify our test results. One such premise—one which could have been violated—is the premise that *perceptions* of stereotype necessarily correspond to *presences* of stereotype. In our putting forth the performance discounting hypothesis, we presumed that teacher bias of students' academic abilities would vary according to racial

mismatching, and would correspond to the stereotyping perceived by students. Although the literature is well established on the former issue (i.e., the relationship between racial mismatching and teacher stereotyping), there is less consensus on the latter (i.e., whether and/or how the presence of stereotyping translates into student perceptions of stereotyping). Though much studies show that students can recognize and identify stereotyping by teachers (e.g., , Marshall, Brattesani & Middlestadt 1982; Brettesani, Weinstein, & Marshall 1984; Babad, Bernieri & Rosenthal 1989), some have suggested otherwise (e.g., Maddon, Jussim, & Eccles 1997). Too, some studies have suggested contrasting ways by which students may perceive teacher bias depending on whether the bias implicit (e.g., Van Den Bergh et al. 2010) or explicit (e.g., Harber et al. 2012). The topic brings to full circle the question that, in part, motivated this study. How do blacks respond to or cope with teachers' prejudice and bias against them? Do black students believe all or part of the stereotype laid out against them to be really true about themselves? That is, do blacks "internalize" others' biased views of their academic abilities and achievement potential? Or, do blacks recognize and identify such views as racial prejudice and respond accordingly? This study, to recap our theoretical framework, took the latter position, and did so based on the "black paradox" literature that has long reported the enigma of blacks' relatively high self-concepts (including academic self-concepts). A hypothesis was put forth that related the psychological strategy of stereotype recognition to the institutional environment of school, to test the relationship between performance discounting and racial mismatching. Yet, it should be granted that simply because someone has a high self-concept does not necessarily negate the possibility that their response to prejudice could be one of internalization. Some evidence for this comes

from the present study, which showed a decrease in blacks' relative academic self-concept between the 3<sup>rd</sup> and 8<sup>th</sup> grades. This is not entirely at odds with the notion that blacks begin their school career with a relatively high academic self-concept (for reasons unknown and not discussed in this study), but that perhaps their self-concept declines at a faster rate than whites' due to increasing internalization of negative stereotypes. If such is the case, then the racial mismatch hypothesis would not be able to properly indicate whether the performance discounting theory holds or not. This is a topic that requires much greater attention in the future studies.

In the next chapter, the empirical analysis of this study will be concluded by formally presenting a developmental picture of the racial disparity in ABAA. Thus far in this chapter, we discussed age-group differences in academic self-concept and their relation to achievement. We did so based on comparisons of cross-sectional analyses of 8<sup>th</sup> and 3<sup>rd</sup> graders. Although such cross-sectional comparisons can be informative, they are limited in their ability to identify the developmental process underlying the outcomes. Panel analysis is better suited to examining such temporal processes. As mentioned, the literature is lacking in research on race-ethnic disparity in ABAA, a gap this study aimed to fill; however, even less is known about its temporal dynamics over childhood. How does ABAA change with age, as children advance through childhood? And how do racial differences in ABAA change? To answer these questions, I now turn to the panel analysis.

**CHAPTER 8**  
**EMPIRICAL ANALYSIS III:**  
**RACIAL DISPARITY IN THE RELATIONSHIP BETWEEN**  
**ACADEMIC SELF-CONCEPT & ACHIEVEMENT:**  
**PANEL ANALYSIS (3<sup>RD</sup>, 5<sup>TH</sup>, AND 8<sup>TH</sup> GRADES)**

The comparison of cross-sectional results from the 3<sup>rd</sup> and 8<sup>th</sup> grades offered two cross-sectional examinations of academic self-concept and its relation to achievement. This chapter takes advantage of the panel design of the ECLS-K study to present a more formal picture. A growth curve model will utilize data collected for individual students at three time points (3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade), to examine changes and stability of academic self-concept and its relation to achievement over the six-year period, *and* the factors that predict these changes. The goal of this chapter is to see 1) whether performance discounting is fixed or develops over the course of childhood, 2) whether there is a racial difference in how performance discounting develops, and 3) whether racial mismatch (early exposure) influences these developmental patterns in performance discounting. A unique advantage of growth curve modeling (or HLM/multilevel model) is its ability to handle intra-individual changes and inter-individual differences in the changes simultaneously and efficiently. Furthermore, this chapter aims to see if performance discounting remains the same across external and internal frame of reference. The panel design with three time points allows disentangling of the variations in achievement into between-person and within-person, making this investigation possible. For example, if low-achieving blacks have an elevated level of academic self-concept compared with

their counterpart whites at a given point in time, this would manifest itself as a weaker between-person ABAA for blacks. On the other hand, if these low-achieving blacks' academic self-concepts fluctuated according to fluctuations in their own performance, then their within-person ABAA would be shown to be just as strong as whites'—albeit at elevated levels. Our panel analysis allows us to see whether there is a racial difference in how students' academic self-concept responds to the changes in one's own performance over time (i.e., within-person), separately from how students' academic self-concept is associated with achievement at any given point in time (i.e., between-person). Our panel analysis allows us to see whether there is a racial difference in how students' academic self-concept respond to the changes in one's own performance over time (i.e., within-person), separately from how students' academic self-concept is associated with achievement at any given point in time (i.e., between-person). The findings should offer new insights into the meaning and implication of racial disparity in performance discounting.

In terms of this chapter's organization, I first briefly present the developmental perspective that guides expectations for this chapter's research questions and hypotheses. I then present the descriptive results which show how much variation in each time-dependent variable is due to within-student variation, as opposed to between students. This description is to show whether panel analysis is warranted. Third, the multilevel growth curve model is run and the basic findings on the levels of academic self-concept and its developmental path are discussed. Fourth is a presentation and discussion of the findings for the three research questions posed in this chapter, which are as follows: 1) does students' performance discounting follow a developmental path? 2) Is this

developmental path distinct between races? 3) Does early exposure to racial mismatching influence racial disparities in these developmental paths? In presenting, I first discuss the result based on achievement in the way achievement is conventionally represented (un-disentangled); then, I present the results based on achievement that is partitioned into between- and within-person achievement. Finally, the chapter concludes with a summary and discussion.

This chapter will continue to employ the labeling convention used in the previous two chapters. The phrase “association (or relationship) between academic self-concept and achievement” is abbreviated to ABAA. The phrase “student-teacher racial mismatch” is referred to as “racial mismatch”. All mentions of academic self-concept and achievement (IRT and teacher ratings) pertain to the domain of English/reading unless otherwise stated.

## DEVELOPMENTAL PERSPECTIVE

Although developmental patterns of academic self-concept are well established in the literature (see Chapter 2), studies have mostly been conducted on Caucasian samples, and how these patterns may vary according to race is unclear (cf. Wigfield & Eccles 2002). For example, research has shown that academic self-concept tends to decline and become more correlated with academic outcomes as children transition from elementary to middle schools. However, it is unclear whether such developmental changes apply similarly to all races. In particular, it is unclear whether blacks’ greater tendency for performance discounting (vs. whites) remains stable, grows, or declines with age.

On the one hand, research suggests that children become increasingly aware of stereotypes about their racial groups as they age, including stereotypes of racial differences in academic abilities (McKown & Weinstein 2003; Okeke et al. 2009; Rowley et al. 2007). Such changes would imply there is a widening of the racial gap in performance discounting, if it is the case that perceived stereotypes are associated with performance discounting. This scenario would entail blacks following a developmental path of ABAA that increases but at a slower rate than that of whites.

On the other hand, schools (especially public schools) are known as environments where many children first come into contact with people of different backgrounds. It is here that they come to learn and absorb the common culture and norms that underlie mainstream society (e.g., Coleman, Hoffer, & Kilgore 1982). Since it is well known that one of the key contributing factors to inter-individual differences in self-concept is the cultural characteristics associated with an individual's race/ethnicity (e.g., racial socialization), one could conceive that the differences in academic self-concept that exist at a very early age gradually diminish as children become increasingly exposed to mainstream culture through school over time. Such changes would potentially entail, for blacks, a "corrective" developmental trend of ABAA that increases, and does so at a faster rate than that of whites.<sup>27</sup>

Lastly, it is possible that racial differences in academic self-concept and its relation to achievement are non-developmental, in which case, we would expect the racial gap in ABAA to remain constant over time. As this study has shown—and others as well

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<sup>27</sup> Though proponents of the oppositional culture theory might argue against this rationale (based on the notion that black students do not assimilate into the mainstream culture inculcated by schools but rather build and maintain their own cultural/racial identity in opposition to it (e.g., Ogbu 2004)), the research on oppositional culture has mostly been based on adolescents, and it is uncertain how *young* black children in elementary schools might respond to encountering the mainstream culture in their beginning stage of identity formation (i.e., the encounter stage) (cf. Tatum 1992).

(e.g., Graham 1994)—, the black-white differences in academic self-concept and its relation to achievement are evident from very young ages. Should these early factors behind racial disparity in academic self-concept (e.g., socialization processes) be unrelated to developmental changes, we may observe developmental trends of ABAA that increase at similar rates for both blacks and whites.

Thus, the first two research questions of this chapter are: 1) developmentally, do children discount performance less and less while growing up? That is, does the correlation between academic self-concept and achievement (or ABAA) grow stronger over time? 2) Is the rate of rise in ABAA slower for blacks than for whites? Or, is it faster (i.e., corrective) for blacks? Or, is there no difference between blacks and whites?

The third research question of this chapter asks how the performance discounting theory applies from a developmental perspective. Does early exposure to teacher bias relate to distinct developmental paths of performance discounting across race? The question is examined by observing how changes in ABAA over the six-year period relate to the initial racial mismatching in 3<sup>rd</sup> grade. Although the stereotype threat theory is based on situational stereotypes, in which the effect of the stereotype threat is generally contemporaneous (i.e., the stereotype threat at time  $t$  affects performance at time  $t$ ), scholars have also suggested a more enduring consequence of stereotype threat in the form of “disidentification” (e.g., Steele 1992, 1997; Osborne 1997). They argue, for example, that chronic exposure to stereotype threats can lead people to the point of permanently devaluing or “disidentifying” their self-views from the task domain even when they are not in stereotype threat situations. This process is purported to be gradual rather than sudden, as people are said to first resort to discounting negative performance

and its feedbacks until they no longer “care” to put any value in the task at all. If true, then students exposed to stereotyping early in life, *ceteris paribus*, should exhibit greater disposition to performance discounting for the remainder of their school years, compared with those who were not exposed to stereotyping early in life. In other words, the consequence of early exposure to racial mismatching would manifest in the form of distinct developmental changes in performance discounting. On the other hand, if the impact of perceived stereotyping on performance discounting is strictly situational, then exposure to racial mismatching in 3<sup>rd</sup> grade, for example, should have little bearing on the progression of ABAA beyond 3<sup>rd</sup> grade. Thus, the third research question of this chapter is: 3) is early racial mismatching related to distinct developmental paths of ABAA in blacks and whites?

Finally, these questions are explored under two different frames of reference by which self-concepts are constructed. In the development literature, young children’s overly optimistic self-image is often attributed to the children’s ability to use internal frame of reference (e.g., “I can run faster today than I did last month”) and their concomitant lack of skills to incorporate external frame of reference (e.g., “all my friends are faster than me”) in constructing self-views (Harter 2012). In one, a child appraises or assesses himself based on social comparisons (comparing himself to others); in another, the self-appraisal is based on internal comparison of oneself between his own past and present. The question for this study is whether racial disparity in performance discounting varies according to frames of reference; if it does, what does it mean? This study expects that there should be no such variations. The rationale is that attributional ambiguities, an essential factor in performance discounting, is presumed present whenever there is

perceived stereotype. Whether a person compares his performance to those of others (e.g., “My score is worse than my friends, but my score is biased”) or to his prior performance (e.g., “My score is worse today than last month, but last month’s feedback was biased”), a person subjected to stereotypes is expected to show a greater detachment between his academic self-concept and achievement. Though a magnitude or strength may differ, racial disparity in performance discounting should essentially follow the same direction regardless whether the variation of achievement is between- or within-person.

As to the developmental progress in terms of racial patterns, it is unclear whether there should be differences according to the frames of reference. As peer comparison is shown to become more salient in the construction of self during adolescence (cf. Harter 1999; Stipek & MacIver 1989), it is expected that the rate of increase in ABAA would be greater based on the between-person achievement than on the within-person. On the other hand, a child’s self-concept is said to become more crystallized as his/her personal history accumulates, and thus less likely to change irregardless of the frames of reference. But, these studies pertain to *all* students and do not address possible racial distinctions. Thus, it remains to be seen how the racial patterns in ABAA by frames of reference develop over time.

## FINDINGS

### *Developmental Paths of Academic Self-Concept and Its Racial Difference*

Table 7.1 shows the results from the multilevel linear growth model. The dependent variable was the level of academic self-concept for student  $i$  at time  $t$ . The predictors in the first level were: average initial level of academic self-concept for student

$i$  (i.e., intercept—in our case, the 3<sup>rd</sup> grade academic self-concept), time  $t$ , achievement for student  $i$  at time  $t$ , a time\*achievement interaction for student  $i$  at time  $t$ , and time-varying controls for student  $i$  at time  $t$  (school % black, school % free lunch, school climate, and retention status for student  $i$  at time  $t$ ). In turn, the student's intercept, time slope, achievement slope, and time\*achievement slope were each predicted by the Level-2 predictors: average values across all students (Level-2 intercept), student's race, sex, family SES, and cognitive score at kindergarten. Each student's Level-1 intercept and time slope were allowed to vary across students (i.e., random effects). This regression analysis is aimed to reveal the developmental trajectory of academic self-concept and its relation to achievement over time. Achievement, in this analysis, is treated conventionally (i.e., not partitioned into between/within-person).

*Does academic self-concept follow a developmental path? If so, is this distinct for blacks and whites?*

The developmental path of academic self-concept is represented by the regression coefficient for “time” in Table 8.1. It shows that children's level of academic self-concept declined over the course of elementary and middle school (-0.411,  $p < 0.05$  for IRT; -0.281,  $p < 0.05$  for teacher rating; -0.339,  $p < 0.05$  for parental rating). The finding is consistent with the literature. Interestingly though, the steepness of the decline was not significantly different between races, as indicated by the slope of the relationship between race and time (i.e., the race\*time interaction) (0.007,  $p = 0.71$  for IRT; 0.019,  $p = 0.31$  for teacher

rating;  $-0.002$ ,  $p=0.92$  for parental rating). With respect to test scores, an average<sup>28</sup> *white* student's academic self-concept declined at a rate of  $0.411$  units<sup>29</sup> per year from an initial level of  $3.224$  (intercept—or 3<sup>rd</sup> grade level); while the *black* counterpart's academic self-concept declined at the same rate from a *higher* initial level of  $3.315$ —with the difference in initial levels being statistically significant ( $0.091$ ,  $p<0.05$ ). Thus, it appears that there was no developmental adjustment by blacks (or whites) that would reduce the initial racial gap evident in 3<sup>rd</sup> grade. The pattern was similar with respect to teacher ratings and parental ratings. There was also considerable heterogeneity in the individual trajectories of academic self-concept, indicated by the statistically significant variance components for intercept and slope in Table 8.1 (e.g., with respect to test scores,  $0.379$ ,  $p<0.05$  and  $0.258$ ,  $p<0.05$  for the intercept and time slope respectively).

Beside race, other individual characteristics of children were also related to the trajectories of academic self-concept. For example, the decline in academic self-concept was slower for students from high-SES families (e.g.,  $0.041$ ,  $p<0.05$  for IRT) and for females than for males<sup>30</sup> ( $0.107$ ,  $p<0.05$  for IRT;  $0.075$ ,  $p<0.05$  for teacher rating;  $0.108$ ,  $p<0.05$  for parental rating). Interestingly, these individual characteristics were related only to the rate of decline of academic self-concept, and not its initial level in 3<sup>rd</sup> grade. Lastly, some contemporaneous relationships were shown between academic self-concept and the time-varying controls—i.e., school context and student retention status.

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<sup>28</sup> A male student with average achievement (in this case, average test score), from average SES family, with average kindergarten cognitive scores, in average school contexts each year, and have never been retained.

<sup>29</sup> Note that academic self-concept is not standardized and ranges from 1 to 4, with 4 being the highest academic self-concept.

<sup>30</sup> Studies have shown that, in comparison to boys, girls' academic self-concepts tend to be higher in reading and lower in math, and that this gender gap tends to increase over time (e.g., Jacob et al. 2002).

### *Developmental Path of Performance Discounting and Its Racial Differences*

In Table 8.1, performance discounting is inversely represented by ABAA (i.e., higher ABAA equals less discounting) and is represented by the regression coefficient for achievement. Its developmental path (changes in ABAA over time) is indicated by the regression coefficient for the Time\*Achievement interaction (i.e., the more positive the interaction, the higher the rate of increase in ABAA over time—or, equivalently, the higher the rate of decline in performance discounting).

*Does performance discounting follow a developmental path? If so, is this distinct for blacks and whites?*

Table 8.1 shows that, for all children, performance discounting declined over time; children discounted performance less and less over time, indicated by the positive Time\*Achievement interaction (0.043,  $p < 0.05$  for IRT; 0.188,  $p < 0.05$  for teacher rating; 0.066,  $p < 0.05$  for parental rating). This rising path of ABAA, however, did not have significantly different steepness for blacks and whites, as indicated by the regression coefficient for race predicting Time\*Achievement slope (-0.012,  $p = 0.42$  for IRT; -0.004,  $p = 0.84$  for teacher rating; -0.015,  $p = 0.32$  for parental rating). This was a surprise, given the larger racial gap in ABAA shown in 8<sup>th</sup> grade than in 3<sup>rd</sup> grade for the cross-sectional analyses (especially for IRT and parental rating). Although the sizes of the negative interaction coefficients were quite substantial for both ratings (-0.012 and -0.015) and would have suggested a growing racial gap in ABAA, statistical significances were simply not high enough ( $p = 0.42$  and 0.32).

As expected, ABAA was weaker for blacks than for whites at all times, as indicated by negative achievement slope associated with race (e.g., -0.040,  $p < 0.05$  for IRT); but there was neither a trend of narrowing nor widening of such racial differences. Blacks' relative weakness in ABAA was first evident in 3<sup>rd</sup> grade and was maintained throughout elementary and middle school.

*Does racial disparity in performance discounting follow similar patterns across frames of reference?*

The regression analysis above was replicated, but this time analytically distinguishing between “between-person” and “within-person” variations in achievement. The model specification was the same as before, except that now the achievement for student  $i$  at time  $t$  in Level-1 was the deviation of the student's achievement at time  $t$  from his mean achievement across three waves; and, in Level-2, the student's mean achievement was added as a time-invariant predictor, as was its interaction with race. Thus, the regression coefficient of within-person achievement in Level-1 indicates performance discounting based solely on how much a student discounts his performance in terms of its improvement/decline at time  $t$  from his mean performance over time (or his mean relative standing over time). Meanwhile, the regression coefficient of the achievement (between-person) in Level-2 for predicting time is an indicator of performance discounting, based on how much a student discounts his mean performance relative to that of other students at time  $t$ .

Table 8.2 shows the results. In this analysis, as expected, a sizable and statistically significant racial disparity in performance discounting was found with respect to

between-person achievement. But, contrary to expectation, the racial disparities were *not* found for within-person achievement. For example, a white child's initial academic self-concept was significantly associated with his mean achievement (e.g., 0.322,  $p < 0.05$  for IRT; 0.263,  $p < 0.05$  for teacher rating), but this relationship was much weaker for blacks (e.g., -0.100,  $p < 0.05$  for IRT; -0.045,  $p = 0.06$ ). This indicates a racial disparity in performance discounting for between-person achievement. However, for both white and black children, academic self-concept at time  $t$  was significantly *and* similarly related to their improvement/decline in achievement. For example, with respect to teacher ratings, ABAA based on "Deviation Achievement" was 0.129 ( $p < 0.05$ ) for an average white student, and showed no significant racial difference (-0.016,  $p = 0.675$ ); likewise, the within-person ABAA for test scores was 0.123 ( $p = 0.15$ )—albeit with lower significance—and with no significant racial difference (-0.031,  $p = 0.598$ ). There was no racial disparity in performance discounting with respect to within-person achievement, indicating no racial disparity in ABAA based on the internal frame of reference.

Developmentally, ABAA grew stronger over time (or performance discounting declined over time), but only with respect to between-person achievement (0.021,  $p < 0.05$  for IRT; 0.085,  $p < 0.05$  for teacher rating; 0.031,  $p < 0.05$  for parental rating). With respect to within-person achievement, ABAA remained constant over time (-0.056,  $p = 0.349$  for IRT; 0.036,  $p = 0.332$  for teacher rating; 0.006,  $p = 0.884$ ). This finding is consistent with the literature, which shows that children's skills in making social/peer comparisons increasingly develops over time (Stipek & MacIver 1989; Harter 1999). The finding suggests that the importance people ascribe to internal comparisons when constructing their self-views may grow relatively weakly compared to the importance

people ascribe to social comparisons. In both cases, there were no racial differences in the developmental path of ABAA (009,  $p = 0.545$  for between-person ABAA with IRT; -0.014,  $p = 0.764$  for within-person ABAA with IRT).

In summary, this section's findings show that all students tended to discount performance less and less over childhood. In other words, there were no racial differences in this decline. At all times, blacks were still more likely to discount performance than whites, and their weaker ABAA remained constantly weaker throughout the course of elementary and middle school. In addition, performance discounting was shown to be limited to between-person performances and *not* within-person. That is, although ABAA was weaker for blacks than for whites at any point in time, both blacks' and whites' academic self-concepts responded similarly to fluctuations in their own performances over time. In either case, there was still no evidence of racial difference in the developmental path of ABAA.

Overall, the result showing no racial difference in the developmental path of ABAA suggests that the factors behind the racial disparity in performance discounting may be non-developmental and/or unrelated to developmental increases in the awareness of stereotypes. It also suggests that the factors behind racial disparity in ABAA may already be present prior to, or in the early stages of, children's schooling—e.g., preschool or the first couple years of elementary school. One possible explanation is racial socialization (Bowman & Howard 1985; Hughes et al. 2006), which takes place early in life and can influence children's perceptions of race and self for the rest of their childhood development. It is possible that racial socialization gives black children, especially those who would potentially be most vulnerable to reduced self-concepts—i.e.,

underachievers—a boost to their academic self-concepts, which serves to protect their self-concepts throughout their school years. In fact, a closer look at the cross-sectional distribution of academic self-concept across the distribution of achievement does suggest that such a conjecture is a possibility; the mean academic self-concept across the achievement deciles are less dispersed for blacks than for whites (table not shown) at all times. This is because of blacks' (vs. whites') higher academic self-concept at the lower achievement deciles.<sup>31</sup> Such types of cross-sectional differences, however, should not necessarily imply that black children's academic self-concept would be any less (or more) responsive to the changes in their own achievement and, indeed, the results for within-person achievement bear this out: there was no racial disparity in performance discounting with respect to the changes in a child's own performance over time. Both blacks and whites formulated their self-concept similarly in response to changes in their own achievement.

The findings above, however, could be confounded if it is the case that racial mismatching is systematically related to performance discounting. To more carefully examine this possibility, the analysis above is replicated, but is now explicitly conditioned by patterns of racial mismatch. Specifically, it examines how early exposure to racial mismatching may relate to a racial disparity in developmental progresses in performance discounting.

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<sup>31</sup> This distribution is a distribution of the *mean* academic self-concept across the distribution of achievement deciles (i.e., the distribution of *ten* mean academic self-concepts for ten achievement percentiles), and is different from the overall standard deviation of academic self-concept. The latter depends on the sample size (for which blacks are more likely to have a higher standard deviation due to their much smaller sample size) and is weighted more heavily towards the achievement levels that are prevalent. The former removes the influence of sample size and offers a better glimpse at how academic self-concept is distributed in relation to the distribution of achievement.

### *Early Exposure to Racial Mismatching & the Development of Performance Discounting*

To examine performance discounting theory from a developmental standpoint, a subsample analysis<sup>32</sup> was conducted to see whether the developmental path of ABA would be distinct across race if blacks were in a racially mismatched (vs. matched) class in 3<sup>rd</sup> grade. To better control for the mismatch patterns in subsequent years (5<sup>th</sup> and 8<sup>th</sup> grades), the groups were further divided according to their 5<sup>th</sup> and 8<sup>th</sup> grade teachers' race, and comparisons were made only between students with similar 5<sup>th</sup> and 8<sup>th</sup> grade mismatch patterns. Thus, four subsamples were created based on the following mismatch patterns<sup>33</sup>:

(Group 1) white teacher in 3<sup>rd</sup> grade & white teacher in 5<sup>th</sup> & 8<sup>th</sup> grades

(Group 2) *black teacher* in 3<sup>rd</sup> grade & white teacher in 5<sup>th</sup> & 8<sup>th</sup> grades

(Group 3) white teacher in 3<sup>rd</sup> grade & *black teacher* in 5<sup>th</sup> or 8<sup>th</sup> grades

(Group 4) *black teacher* in 3<sup>rd</sup> grade & *black teacher* in 5<sup>th</sup> or 8<sup>th</sup> grades

Then, two separate comparisons were made: (1) vs. (2), and (3) vs. (4).<sup>34</sup> Group (1)

would be considered “early mismatched” while Group (2) was “early matched”;<sup>35</sup>

likewise, Group (3) would be considered “early mismatched” while Group (4) was “early

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<sup>32</sup> I opted not to conduct the full sample analysis with higher order interactions, because doing so would have required estimating 4- and 5-way interaction effects, which is unwieldy and unstable; therefore, despite some of the limitations that subsample analyses present (such as exogeneity issues), I chose to employ this approach to explore the research question at hand.

<sup>33</sup> The sample size/coverage for each group was as follows: Group 1) total = 7874; white = 7012, black = 862; Group 2) total = 234; white = 123, black = 111; Group 3) total = 889; white = 635, black = 254; Group 4) total = 500; white = 49, black = 451.

<sup>34</sup> To make the matching more exact (e.g., matched in 3<sup>rd</sup> and 5<sup>th</sup> and 8<sup>th</sup> grade), sufficient case coverage was needed for *eight* subsamples ( $2^3 = 8$ ) rather than the four we used. However, with eight subsamples, there would have been multiple cells with extremely small sample sizes or no cases at all, leading to unstable estimates. This study decided that the analysis with four subsamples was a better option, with an emphasis on the comparison between 1 vs. 2, and a cautious interpretation for 3 vs. 4.

<sup>35</sup> Note here that “mismatch” is a reference to black students. Obviously, in white teacher classrooms, white students are matched while black students are mismatched. As already mentioned, the relevance of racial mismatch in this study draws from the argument that stereotypes against black students vary according to racial mismatching of teachers for black students but not for white students; there is no negative stereotyping towards white students by either white or black teachers. Hence, the category terms “match” and “mismatch” are used in reference to black students.

matched.” The expectation was that, if perceived stereotype’s relation to academic self-concept was only situational or contemporaneous, the developmental trend in the racial gap in ABAA would be similar across the groups in each pair. However, if perceived stereotype has a long-lasting or enduring effect, the trend in the racial gap in ABAA should be distinct across the groups in each pair; namely, the trend should be higher for (1) than (2), and higher for (3) than (4). All analyses in this section were conducted with achievement decomposed into between- and within-person components.

*Is early racial mismatching related to different developmental paths of performance discounting in blacks and whites?*

Similar to the cross-sectional results on the racial mismatch tests, the test results were mostly non-significant. Comparing Group (1) vs. Group (2), there was no difference in the developmental trend of the racial gap in ABAA between the two groups. With respect to within-person test scores, ABAA was constant over time, as the interaction between time and within-person achievement was not statistically different from zero, and this was true for both blacks and whites, as the interaction among race, time, and within-person achievement was negligible. With respect to between-person test scores, ABAA arose over time for Group 1 (0.017,  $p < 0.05$ ) but the rate of increase was similar for both blacks and whites (0.014,  $p = 0.426$ ). For Group 2, ABAA was constant for all students, and thus there were no racial differences in the performance discounting trends. The patterns were similar with respect to teacher ratings, except that the rise in ABAA for between-person teacher ratings was evident not just for Group (1) but also for Group (2); however, there were still no racial differences in the rate of these increases within and

across groups. Thus, unlike the expectation that early exposure to racial mismatch (i.e., Group (1)) would yield distinct racial differences in how performance discounting would decrease/increase over time, we not only found no such differences across groups, but no racial differences within groups as well. The black-only analysis generally confirmed these findings, as it showed no significant group differences in the paths of ABAA. For example, blacks' ABAA was similarly constant across and within groups with respect to within-person achievement, and showed a similar increase with respect to between-person achievement (teacher ratings).

Comparing Group (3) vs. Group (4), the patterns were largely the same as (1) vs. (2). However, with respect to between-person achievement, white students in Group (3) showed a decline in ABAA over time ( $-0.07, p < 0.05$ ) rather than a rise, while black students in the same group did not show such a rate of increase, with the interaction between race, time, and between-person achievement being  $0.10 (p < 0.05)$ . Because blacks (vs. whites) in Group (3) had shown weaker ABAA in 3<sup>rd</sup> grade ( $-0.11, p < 0.05$ ), this racial difference in the ABAA trends reduced the racial disparity in performance discounting over time. In Group (4), on the other hand, there was neither a significant 3<sup>rd</sup> grade racial difference in ABAA nor a racial disparity in ABAA trends; ABAA remained constant for all students. Thus, the findings were somewhat the opposite of what was expected, as those who were exposed early to white teachers (i.e., Group (3)) did not show greater racial divergence in relative performance discounting but, rather, a tendency for racial convergence in ABAA. The patterns were similar with respect to teacher ratings except that, for Group (3), whites' ABAA for between-person achievement did not decline but remained constant; nonetheless, the rate of rise in ABAA for blacks was still

positive and significant (0.08,  $p < 0.05$ ), thereby producing the same converging trend in performance discounting. The blacks-only analysis generally confirmed the findings above, as the blacks in these groups either remained similarly constant in their performance discounting, or similarly declined in their performance discounting, except for blacks in Group (3), who showed a greater decline in between-person performance discounting than did blacks in Group (4).

The results for (3) vs. (4) are interesting, but should be viewed with some caution since Groups (3) and (4) were based on students who had black teachers in *either* 5<sup>th</sup> or 8<sup>th</sup> grade.<sup>36</sup> Thus, there is a somewhat greater chance of a confounding influence of racial mismatch according to what happens during 5<sup>th</sup> and 8<sup>th</sup> grade for the (3) vs. (4) comparison. It is, however, evident that in both comparisons ((1) vs. (2) and (3) vs. (4)), that there does not appear to be strong support for the conjecture that early racial mismatching has a negative impact on blacks' developmental path of ABAA. If anything, it appears, as shown by the racial difference in Group (3), that early mismatching appears to lead to a corrective trend, in which the racial disparity in *between-person* performance discounting is narrowed. However, this latter trend was based not on a greater increase in ABAA by blacks but, rather, by an unexpected decline in ABAA by whites who experienced changes in racial matching across years. One reason for this could be that whites, too, may face stereotyping from white teachers. For low-achieving whites, for example, white teachers' perceptions of their academic abilities could be more harsh than those of black teachers (e.g., Morris 2005). If such is the case, the low-achieving whites who come into black teacher classrooms after having experienced white teachers might

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<sup>36</sup> See footnote 34

experience a relative buoyancy in their academic self-concept, which would narrow or compress the cross-sectional distribution of academic self-concept across achievement in later years (which would entail a weaker cross-sectional slope). A qualitative study by Morris (2005) points to this kind of possibility of white-teacher stereotyping on disadvantaged whites—albeit his study was focused on a predominantly minority school. With that said, the one common thread in all the analyses above was that in no groups—(1), (2), (3), and (4), and for both blacks and whites—were there any developmental changes in performance discounting with respect to *within-person* achievement (i.e., the internal frame of reference). This finding offers the strongest evidence yet that racial mismatching may not have any long-lasting impact on whether blacks are less likely to respond to performance feedback in constructing their academic self-concept than are whites, unlike what the theory of disidentification might suggest (e.g., Steele 1997). It appears that the racial disparity in performance discounting is strictly a distributional phenomenon at a cross-section, rather than an individual property pertaining to a person's own changes over time.

## **CONCLUSION**

This chapter examined the development of academic self-concept, its relation to achievement, and the ways that this development may differ by race. Furthermore, it explored how early exposure to racial mismatching might be related to these issues.

Consistent with the literature (e.g., Stipek & MacIver 1989; Eccles, Wigfield, & Blumenfeld 1993; Harter 1999), this study found that the development of academic self-concept was such that students' initially optimistic academic self-concept declined over

time and became more realistic. The rate of this decline was similar among blacks and whites. The only racial difference in this developmental change was the initial level of academic self-concept (measured at 3<sup>rd</sup> grade), which was higher for blacks than for whites. This early racial disparity in academic self-concept remained unchanged over the course of elementary and middle school.

As expected, performance discounting also declined with age for all students; that is to say, the correlation between academic self-concept and achievement (or ABAA) grew stronger over time. This finding is consistent with the literature (Harter 1999; Stipek & Harter 1989). However, the rate of increase in ABAA did not differ between blacks and whites. The only racial difference in the trend of ABAA was the initial discounting (measured at 3<sup>rd</sup> grade), which was greater for blacks than for whites. This initial difference in performance discounting between blacks and whites remained unchanged throughout the course of elementary and middle school.

One notable finding in these analyses was that a racial disparity in performance discounting was evident for between-person achievement but not for within-person achievement. This suggests that there could be a racial difference in how a child responds to his own performance feedback in comparison to that of others (i.e., an external frame of reference) but not necessarily in how the child responds to his performance in comparison to his own prior performance (i.e., an internal frame of reference).<sup>37</sup> Ideally, one would also examine these within separate school contexts—e.g., in segregated schools vs. integrated ones—but because many children in our sample changed their

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<sup>37</sup> “Ideally, one would also examine these within separate school contexts—e.g., in segregated schools vs. integrated ones—but because many children in our sample changed their schools over time, subsampling by school context was difficult practically. The analysis was conducted while simply controlling for the contemporaneous school context at each wave.”

schools over time, subsampling by school context was logistically difficult. The analysis was conducted while simply controlling for the contemporaneous school context. Our results also showed that ABAA grew stronger for between-person achievement while it was constant for within-person achievement, for both blacks and whites. The finding is consistent with the literature which shows that children increasingly put greater importance on peer comparisons (as opposed to internal comparisons) as they grow older.

Finally, this chapter explored how early racial mismatching might affect the racial disparity in the development of performance discounting. In general, there were no racial differences, both within and between different early mismatch patterns. This finding is in contrast to the belief that stereotype threats could have enduring or cumulative influences on performance discounting (cf. disidentification theory). If blacks were to have become disidentified with academics through increasing disengagement, one would have expected to see an increasing racial disparity in performance discounting over the course of childhood. No such evidence was found.

In sum, the findings in this section suggest that the influences on racial disparity in performance discounting might not be developmental and/or unrelated to the developmental changes in a child's stereotype awareness. Particularly notable is the finding that the initial racial disparity in performance discounting (evident in 3<sup>rd</sup> grade) neither diminished nor grew over time. Such a finding implies that the causes of racial disparity in performance discounting are likely to be present in either pre-school or early elementary school stage, and be among those factors that do not change over time.

One such cause may perhaps be found in blacks' childhood socialization process. In particular, that which involves preparing young blacks to cope with racism and racial

discrimination. Studies have shown that such preparation begins very early in life and generally within family context via parents (e.g., Hughes et al. 2006). An important part of this process is said to be “racial socialization,” which is defined broadly as a process by which people are taught about what to make of their racial group and racial situations (e.g., Bowman & Howard 1985). For blacks, the content of racial socialization messages is said to consist of: 1) black pride (African-American heritage and unity), 2) self-development (emphasis on positive character traits), 3) racial inequities and barriers (emphasis on awareness of institutional and individual racial prejudice and strategic responses—including promotion of mistrust), and 4) egalitarian messages (emphasis on equality between races; Bowman & Howard 1985; Hughes et al 2006). Studies have shown that these messages, when properly instilled, promote more positive self-evaluations (Bowman & Howard 1985; Ou & McAdoo 1993), higher self-efficacy (Bowman & Howard 1985), and more positive in-group beliefs (Knight et al. 1993).

As studies reveal that a majority of black children receive these messages and do so from early on in their lives (e.g., Hughes et al. 2006; Caughey et al. 2002), it is conceivable that these positive self-enhancing and self-protective messages play a role in the phenomena evident in our analyses. They may provide an overall or race-specific increase in the self-concept (including academic self-concept) of students early in their development, especially for those who are particularly vulnerable to low self-concept later in life—i.e., underachievers. Putting it metaphorically, racial socialization messages may “raise the floor”<sup>38</sup> of self-concept for blacks, so that they all come equipped with

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<sup>38</sup> Our cross-sectional analyses have shown that blacks’ performance discounting is a manifestation of the higher-than-expected academic self-concept of the underachievers rather than the lower-than-expected academic self-concept by the high achievers. So, the flattening tilt (of the slope between academic self-

similarly high self-concepts as they begin schooling. In contrast, white self-concept may be more variable—with high white self-concepts being similar to those of blacks, but low white self-concepts being much lower than those of blacks. Such a scenario would imply that, at any given time, the cross-sectional relationship between variations in academic self-concept and achievement *between* students would likely be weaker for blacks than for whites because of blacks' narrower distribution of academic self-concept across the distribution of achievement. This is, in fact, what the distribution of mean academic self-concept across achievement deciles shows (see footnote 31). On the other hand, this same scenario would *not* imply that a black child's academic self-concept would be any less responsive to changes in his/her own achievement over time than that of a white child. That is to say, the within-person relationship between academic self-concept and achievement would not necessarily be weaker for blacks than for whites. This is indeed what the evidence from our analysis bore out when achievement was analyzed at the between-person and within-person levels. The racial disparity in ABAA was shown to exist with respect to between-person variation in achievement, but not with within-person variation.

It appears, thus, that racial disparity in performance discounting may pertain solely to discounting based on an external frame of reference (e.g., peer comparison) but not an internal frame of reference (e.g., comparison of one's current achievement to one's prior achievement). This is yet another piece of evidence that refutes the claim that weaker ABAA is a sign of blacks' disinterest or disidentification with academics. Blacks' self-concept is not at all permanently detached from academic outcomes, but rather

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concept and achievement) is likely more akin to, metaphorically, *raising the floor for those who perform at the bottom*, rather than lowering the ceiling for those who perform at the top.

responds quite well to their changes, except that it does so on different levels than that of whites.

What does it mean to say that there is a distinction in performance discounting according to external or internal frames of reference? For example, do students' learning behaviors at a given time depend on their absolute levels of academic self-concept at that moment, or on changes in academic self-concept from one time to another, or both? What about students' achievement motivation? The literature has largely argued that high academic self-esteem is an indication of high achievement motivation, which promotes high achievement. However, there is also a line of research that has shown that "realistic" or "accurate" self-appraisals, not necessarily high self-esteem *per se*, benefit students' achievement (cf. Crocker 2006; Crocker & Park 2004; Harter 2012). Can we potentially conceive that blacks' relatively weak ABAA in terms of an external frame of reference is a benign phenomenon or, at best, a sign of resiliency? Or, does maintaining a higher absolute level of academic self-concept come at the cost of inaccurate self-knowledge that misleads students and hinders them from making more strategic learning efforts? Who would be more likely to think that they will need extra help for their next assignments or tests: a child whose perceived academic competence is constantly low, or a child whose perceived competence declines from a high level to an average level? Is it the *level* or the *change* that matters? Future studies would do well to probe further into these issues.

Another pertinent question is the same one that was asked in the previous two chapters. What role, if any, does the racial matching of teachers and students play in the process of academic self-concept formation? In all three chapters (3<sup>rd</sup> grade, 8<sup>th</sup> grade,

and panel analyses), there was little evidence that racial mismatching was related to performance discounting—except in specific school contexts. Does this mean that students are aware of teachers’ prejudices, but that such awareness has no role in their construction of academic self-concept? Or does it mean that students are impervious to teachers’ prejudices even when they exist? Answers to these questions can shed more light on the role of racial mismatching on performance discounting.

In the next chapter, this dissertation concludes with 1) a summary of the major findings, 2) the key issues and questions that emerge from these findings, 3) the limitations of this study, and 4) implications for future studies.

## CHAPTER 9

### CONCLUSION

#### **Significance and Contributions**

This dissertation's importance draws from the argument that accurate academic self-knowledge is advantageous to academic success (e.g., Zimmerman 1990; Borkowski & Thorpe 1994; Zimmerman & Risemberg 1997; Pintrich & Zusho 2002). Grades and test scores serve as "carrots and sticks" in guiding students to achieve (e.g., Alexander, Entwisle, & Bedinger 1994; Entwisle & Hayduk 1979); as such, students who fail to respond to performance feedback are more likely to have a misinformed conception of their academic needs, which can result in poorer preparation and less inclination to seek help when needed (e.g., Zimmerman & Risemberg 1997). Well-calibrated self-assessment is advantageous for achievement. Accordingly, performance discounting is a potential challenge to blacks' academic achievement. The racial disparity in performance discounting is a long-standing puzzle, the solution to which will have important consequences.

This dissertation sought an answer to this puzzle from an aspect of the social structure that characterizes many classrooms in U.S. schools. According to the latest figures from the National Center for Educational Statistics (non-projected figures for 2011—12), the percentage of African-American students in U.S. elementary and secondary schools is around 16% (National Center for Education Statistics, 2013, Table 203.50), while some 93% of all teachers in U.S. elementary and secondary schools are non-black (National Center for Education Statistics, 2013, Table 209.10). This translates

into some 70—90% of all black primary school students being taught by teachers who are not of their own race, and are mostly white (Bates & Glick 2013). Although the numbers are similarly striking for other minority groups (e.g., 51% of all students are minorities-in-general, while 82% of all teachers are non-Hispanic whites), racial mismatch poses a special concern for blacks because of the well-documented presence of racial stereotypes against blacks in white-teacher classrooms (Downey & Pribesh 2004; Ferguson 2003; Bates & Glick 2013; McGrady & Reynolds 2013). This dissertation set out to investigate whether racial disparity in performance discounting is structurally patterned by student-teacher racial mismatch in U.S. elementary and middle schools.

The contribution of this study was to link the two distinct literatures: the social psychology literature on performance discounting and the sociology literature on racial mismatch. The literature on performance discounting had previously been limited to laboratory experiments with small non-generalizable samples, while the literature on racial mismatch had seldom considered the discounting process as an outcome of interest. This dissertation addressed these two shortcomings by testing performance discounting in an observational study with a large, nationally-representative sample of schools and students. The analysis was based on the theoretically-driven assumptions that (1) stereotyping perceived by students should vary according to racial mismatch in classrooms (e.g., Downey & Pribesh 2004; Ferguson 2003; Bates & Glick 2013; McGrady & Reynolds 2013 ) and (2) performance discounting should vary according to perceived stereotyping (e.g., Aronson & Inzlicht 2004; Aronson & Steele 2005; Crocker, Voelkl, Testa, & Major 1991; Crocker & Major 1989). The study also tested this theory on a population of young children that had seldom been used to test these hypotheses

before. Based on the assumption that young children (as young as 10 years old) are equipped with sufficient stereotyping knowledge (e.g., McKown & Strambler 2009), this study tested the performance discounting theory on two representative cross-sectional samples of 3<sup>rd</sup> and 8<sup>th</sup> graders and a panel sample of 3<sup>rd</sup> to 8<sup>th</sup> graders in the United States. This dissertation also aimed to advance the literature on two other fronts by investigating (1) the contextual roles of school composition and school climate on performance discounting, and (2) racial disparity in performance discounting from a developmental perspective.

Using a nationally-representative cohort of U.S. students, this study conducted two cross-sectional analyses, one for 3<sup>rd</sup> grade and another for 8<sup>th</sup> grade, and a panel analysis with three waves: 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grades. Different perspectives (cross-sectional vs. panel), multiple achievement ratings (test scores, teacher ratings, parental ratings), and different components of achievement were used (between-person vs. within-person) to describe and explain this puzzling phenomenon of black-white difference in performance discounting.

### **Major Findings**

As suggested by previous research, black students discounted achievement more so than white students when self-evaluating their academic abilities. In both 3<sup>rd</sup> and 8<sup>th</sup> grades, black students' association between academic self-concept and achievement (ABAA) was weaker than whites', and this was shown to be true while holding constant students' individual backgrounds, broad school context, and individual retention status. As expected, school context and retention status explained much of the racial gap in the

mean levels of academic self-concept, but did not explain academic self-concept's *correlation* with achievement.

In 3<sup>rd</sup> grade, blacks' performance discounting was some 30% greater than that of whites with respect to test scores, some 24% greater with respect to teacher ratings, and some 22% greater with respect to parental ratings. Surprisingly, the largest racial gap was not shown for discounting of teacher ratings, but for standardized tests. One reason for this unexpected finding may be that students do not necessarily perceive greater stereotyping from teacher ratings—as this study had presumed. Another reason, speculatively, could be that feedbacks from teachers leave a less room for interpretation and ambiguity about one's performance than does, say, standardized test scores, which could make it more difficult for students to discredit or discount their poor performance. Teacher ratings represent a type of performance evaluation that is frequent, immediate, and easy to interpret (e.g., daily interactions in classrooms and simple report card marks) and, as such, students may find it more difficult to disregard them than other ratings, which may be less frequent and less personal (e.g., standardized tests).

In 8<sup>th</sup> grade, blacks discounted test scores 57% more than did their white counterparts, discounted teacher ratings 31% more, and discounted parental ratings 53% more. As was the case in 3<sup>rd</sup> grade, the largest racial gap was not in the discounting of teacher ratings but for test scores, again suggesting that the extent to which students discount performance may depend not just on the level of perceived racial bias attached to a performance rating, but also on how informative the rating is and how controvertible it would be to disregard it. In all, across the achievement ratings (test scores, teacher ratings, and parental ratings) and in both 3<sup>rd</sup> and 8<sup>th</sup> grades, there were substantial

weaknesses in black students' ABAA, indicating a significant racial disparity in performance discounting.

At the same time, unlike this dissertation's main thesis, the racial disparity in performance discounting was not explained by student-teacher racial mismatch. This study had hypothesized that blacks would perceive greater negative racial stereotyping of their academic abilities in white-teacher classrooms than in black-teacher classrooms and, thereby, show greater performance discounting in white-teacher classrooms than in black-teacher ones. The results did not support this hypothesis. The racial differences in ABAA did not significantly vary across white teacher and black teacher classrooms. Instead, blacks' performance discounting relative whites' was the same was the same in white-teacher *and* black-teacher classrooms. In both 3<sup>rd</sup> and 8<sup>th</sup> grades and across all three achievement ratings (test scores, teacher ratings, and parental ratings), the theory of performance discounting was not supported.

There may be several reasons why the performance discounting hypothesis failed. One, it is possible that the theory is not as applicable to younger people as it is to older people. As the performance discounting theory is premised on a person's ability to recognize stereotyping and skillfully manage this recognition beyond its face-value, it is possible that children in elementary and middle schools are simply too young to do it. Most prior studies on discounting processes, for this reason, have focused on adult populations. Though recent studies suggest otherwise (e.g., McKown & Strambler 2009), 3<sup>rd</sup> and 8<sup>th</sup> graders may simply lack a sufficient stock of social knowledge (e.g., a collective knowledge of stereotypes) and maturity of racial identity to carry out performance discounting in the ways that the theory predicts.

Another possible reason may be that the racial-mismatch assumption—that perceived stereotyping would vary according to teacher’s race—was not met. This study had presumed that the *presence* of stereotyping in teachers would correspond to a *perception* of stereotyping in students (cf. Weinstein et al. 1984). However, it is possible that students do not readily recognize teachers’ biased attitudes and expectations, even when they are present. The literature is mixed on this issue, and does not present a definitive picture. On the one hand, based on the theory of reflected appraisal, it has long been suggested that a person shapes his self-view based on what he thinks are people’s opinion of him (cf. Cooley 1902; Mead 1934; Sullivan 1947; Felson 1985), and that people’s negative biases and attitudes towards a person negatively shapes a person’s self-concept. On the other hand, studies have also suggested that teacher expectation does not directly influence students’ self-perceptions (e.g., Maddon, Jussim, & Eccles 1997) or, if it does, only to a very limited extent (e.g., Gill & Reynolds 1999). And, research has shown that teachers can be aware of their own prejudices towards students and be judicial and/or sometimes even over-compensating in their external practices towards students (e.g., Massey, Scott, & Dornbusch 1975; Harber 2012)—which raises the question of implicit versus explicit form of stereotyping (e.g., Van Den Bergh et al. 2010). If it is the case that perceived stereotyping does not systematically vary according to racial mismatch, then one cannot rule out the possibility that the racial mismatch hypothesis would be nullified even when the performance discounting theory holds true. A better instrument for measuring students’ perceptions of stereotyping would be needed to disentangle this issue.

Finally, it is possible that the theory holds true, but only under more restricted conditions. Here, I discuss the findings on school context and its moderating influence on racial mismatch. As mentioned, most empirical tests on discounting processes have been conducted under laboratory settings with treatment conditions specifically designed for each experiment. It is possible that the significant differences observed in these lab tests are valid in themselves, but, as far as extending these results to real-school settings is concerned, the theory may not have been powerful enough. However, some findings in this study offer a glimpse—if not convincingly demonstrate—that the theory may hold under specific school contexts. For example, in both 3<sup>rd</sup> and 8<sup>th</sup> grades, the racial gap in ABAA was smaller in black-teacher than in white-teacher classrooms (consistent with performance discounting theory) in schools that were predominantly black, but not elsewhere. This finding is suggestive of a significant interaction between the racial composition of schools and racial mismatch in terms of the racial gap in ABAA. The pattern of interaction was in accordance with the group-threat perspective that predicts heightened racial bias by white teachers against minorities in minority-dominated schools and where the comparative frame of reference is other black students (Blumer 1958; Renzulli, Parrott, & Beattie 2011). Surprisingly though, the same type of contextual influences were not shown with respect to the other school context variables this study examined. The variations in SES composition and school climate did not give any more (or less) support for the performance discounting theory. Nevertheless, SES composition and school climate still showed significant relationships to the degree of racial disparity in performance discounting, albeit not distinctively across white- and black-teacher classrooms. The racial gaps in ABAA tended to be greater in high-SES schools and low-

climate schools. On the whole, a more complex picture of the performance discounting theory was suggested by these findings, one in which broad school context possibly interacts with racial mismatching to determine performance discounting according to race. Future studies would do well to more carefully evaluate the theory with these contextual influences in mind.

Finally, the dissertation's panel analyses revealed several notable findings. First, as suggested by the literature, all students' academic self-concepts generally declined over the six-year period spanning 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grades. This was true for both blacks and whites, with blacks showing higher initial levels of academic self-concept in 3<sup>rd</sup> grade. The rate of decline, however, was not different between blacks and whites, with both races showing an average decline of about 12% (SD unit) every year during this period (e.g., test scores). The average individual trajectory of academic self-concept for blacks remained constantly above the average individual trajectory for whites, with no sign of narrowing the gap in academic self-concept over time.

In terms of academic self-concept's relationship to achievement, all students' ABAA grew stronger over time. This is consistent with the literature, which predicts that students' academic self-concepts become increasingly more reflective of academic outcomes as they advance in schooling. This was shown to be true for both blacks and whites, with blacks showing weaker initial ABAA in 3<sup>rd</sup> grade. The rate of rise in ABAA, however, was similar between blacks and whites—or at least the differences were not statistically significant. This was somewhat surprising, given the sizably larger racial gap in ABAA shown in 8<sup>th</sup> grade (vs. 3<sup>rd</sup> grade) in the cross-sectional analyses. (The point estimates for interaction terms all corresponded to a slower rise in ABAA by blacks and

would have suggested a growing racial gap in ABAA—consistent with the cross-sectional patterns—, but statistical significances were not high enough.) Blacks and whites both discounted achievement less and less over time but at a similar rate, such that the initial racial gap in performance discounting in 3<sup>rd</sup> grade remained fixed throughout elementary and middle school.

The panel analysis based on partitioned achievement (between- vs. within-person) also produced several findings of interest. First, as expected, for both between- and within-person achievement, ABAA was strongly positive, meaning the correlation between academic self-concept and achievement were strong both across students at a point in time and within each student over time. The finding was consistent with the literature (cf. Harter 2012), which suggests that the construction of self-concept is based on a person's use of both an external frame of reference (e.g., peer comparison) and an internal frame of reference (e.g., comparison to one's own prior achievements). Moreover, research also suggests that people tend to rely more and more on external frames of reference as they develop (c.f., Harter 2012; Stipek & MacIver 1989). The panel analyses showed that ABAA based on between-person achievement grew stronger over time, while ABAA based on within-person achievement did not change in strength.

Surprisingly though, the racial differences in ABAA were shown only for between-person and not for within-person achievement. This study had anticipated the discounting pattern to be similar in both scenarios. The results, however, showed that, at any given point in time, blacks' ABAA was weaker than that of whites based on between-person achievement but just as strong as whites' in terms of within-person achievement. Furthermore, in both scenarios, there were no racial differences in how ABAA developed

over time. The ABAA based on between-person achievement grew similarly stronger over time for both blacks and whites, while the ABAA based on within-person achievement remained constant for both races. This finding suggests that, if the racial gap in performance discounting is indeed based on racial differences in perceptions of stereotyping, the impact of perceived stereotyping may be limited to discounting of between-person, but not within-person, achievement. It is possible that black students who underachieve may hold higher levels of self-concept than their counterpart white students at a given point in time. Perhaps this is based on blacks' greater degree of between-person discounting (e.g., based on protective boost in self-concept through racial socialization) due to perceived stereotyping. However, these same black students' self-concepts may not necessarily respond any less (or more) to the changes in their own performance. In other words, even though the level of academic self-concept may differ between blacks and whites due to discounting, the changes in these levels, corresponding to the changes in achievement, may not necessarily differ. If this is true, then future studies may find it instructive to construe "performance discounting" more explicitly than how this study conceived it, which was to assume that performance discounting in terms of the *level* of self-concept corresponds to performance discounting in terms of *change* in self-concept. The notion that there could be two disparate types of performance discounting that differentially vary according to race should to be considered carefully in future studies.

Lastly, the developmental patterns of discounting discussed above did not differ according to racial mismatching. This study tested to see if blacks' early exposure to racial mismatching was related to racial differences in the development of performance

discounting. Specifically, this study hypothesized that blacks who were in racially-mismatched classrooms in 3<sup>rd</sup> grade would show development of performance discounting that resulted in a gradual widening of the racial gap over time. This expectation was based on the literature that predicted long-lasting consequences of stereotype threats, in the form of a progressive (and eventually permanent) dissociation between students' academic self-concept and academic outcomes (Steele 1992; 1997). The results of this study's panel analysis did not support the hypothesis. The 3<sup>rd</sup> graders' racial-mismatch patterns were largely irrelevant to the racial distinctions in how performance discounting (both between- and within-person) unfolded over the course of elementary and middle school. Racial mismatch showed little relation to the racial gap in performance discounting from a developmental perspective. In all, across multiple perspectives (cross-sectional and panel analyses), achievement ratings (test scores, teacher ratings, and parental ratings), and frames of reference (external vs. internal), the analyses from this dissertation failed to support the racial mismatch hypothesis. The black-white difference in ABAA was not explained by student-teacher racial mismatch in classrooms.

### **Limitations and Future Research**

One of the strengths of ECLS-K is its wide coverage and generalizability to a larger population. But, even with its purposeful oversampling of small groups, the data still could not satisfy the demands for statistical power in some parts of this study. This was especially the case with the analyses involving sub-samples and, in some cases,

higher-order interactions with broad school contexts. It would have been helpful to see what the results might have been with enough statistical power for some of these analyses.

Another limitation of the study was the potential weaknesses in some of the measures. In particular, the measure that represented the factors pertaining to “disidentification” might have been weak due to the dropping of absence and tardiness variables from the ECLS-K study in 5<sup>th</sup> and 8<sup>th</sup> grade. In 3<sup>rd</sup> grade, student’s record for absence, tardiness, and retention status comprised a set of three variables indicative of students’ academic engagement and motivation. However, in 5<sup>th</sup> and 8<sup>th</sup> grades, only retention status was included because absence and tardiness were not recorded. Although the 3<sup>rd</sup> grade analyses revealed that only retention status had significant statistical relationships with patterns of performance discounting. There is, though, a direction of influence issue when it comes to such variables; and so, it would have been insightful to see how absence and tardiness might have influenced the study’s results in the 8<sup>th</sup> grade and panel analyses. Another variable of some concern was the measure for school climate, which was comprised of responses from approximately two teachers per school on average. Although ECLS-K specifically asked teachers to answer the climate questions regarding their school as opposed to their particular classroom, the measure might have been stronger if the average number of teachers per school had been higher.

Finally, there are two areas of this study that were important but could not be performed. One, the study could have benefited from having a variable that directly measured the level of stereotyping perceived by students. Although there is much evidence that teacher stereotyping varies with racial mismatching, there is less evidence on whether students’ actual level of perceived stereotyping varies according to actual

teacher stereotyping. It would have been instructive to empirically examine the latter relationship, and test the performance discounting theory based on the degree of students' perceptions of stereotyping. Two, it would have been insightful to perform a supplementary analysis that considered the potential reciprocal relationship between academic self-concept and achievement. To do so, the study would have required either 1) measures that could be used as instrumental variables for academic self-concept and achievement, or 2) panel waves (with information on academic self-concept and achievement) that reached back to children's very early years (e.g. preschool). Neither was available (as academic self-concept was first available in 3<sup>rd</sup> grade). Future studies on this topic could benefit from these two additional approaches if the required data is available.

### **Implication for Relevant Issues and Policy**

The practical implication of “perception meets reality”—or in our case, academic self-concept meets academic achievement—is premised on the notion that *self-knowledge* matters in corrective actions, and that having an accurate perception of one's own academic strengths and weaknesses is conducive to self-regulatory behaviors that promote achievement (e.g., strategizing, preparing, and seeking help) (cf. Entwisle & Hayduk 1979; Alexander, Entwisle, & Bedinger 1994). In this light, the weak correlation between academic self-concept and achievement is a concern because it can be a sign that a child's perception of his or her own academic preparedness may be disconnected from reality.

Solving this problem, however, is not a straightforward matter, because in “correcting” children’s academic self-perception, we risk their overall self-esteem being negatively affected. Moreover, because self-esteem has been shown to be especially important among those who are disadvantaged (as a resiliency factor) (e.g., Rutter 1987), any remedies that lead low-achieving black students to have a more realistic perception of their academic standing can be doubly problematic. With that said, inaccurate self-knowledge is still a sign of misperceived reality, and poses challenges to one’s achievement as mentioned above; and, this problem cannot simply be overcome by having high self-esteem (cf. Crocker & Park 2004). So, with a promise to revisit this issue at the end of this section, I turn next to a discussion of the possible solutions to the problem of weak ABAA for blacks, as informed by this study’s results.

First, the question: Why do low-achieving black students have more positively-biased academic self-concepts than do their counterpart whites? This study demonstrated that the blacks’ weak ABAA is constituted by the positively-biased academic self-perceptions of the low-achieving blacks (as opposed to, say, the negative bias exhibited by high-achieving blacks). Here, then, I propose that there are at least two broad ways by which this dissociation comes about: (1) voluntary rejection and (2) misinformation. The former pertains to a self-protective strategy where one selectively accepts and rejects performance evaluations; hence, accepting good scores while rejecting bad ones (e.g., Crocker & Major 1989). This is done “voluntarily” in the sense that the person who rejects the score is *not* lacking accurate information about what constitutes a “good” or “bad” grade (in fact, it is because the person knows what is considered “good” or “bad”, he is able to accept/reject them). As studies have shown, this kind of voluntary rejection

is especially manifest in stereotype threat situations, where a person attributes the cause of poor evaluations to some stereotype bias (e.g., Steele 1992; 1997).<sup>39</sup> This dissertation's central thesis was grounded on this reasoning, as we tested racial mismatch as a cause of blacks' weak ABAA. On the other hand, the concept of "misinformation" pertains to the misalignment of subjective and objective standards of excellence or judgment based on misinformation (e.g., what one considers as "good"/ "bad" performance is not the same as what others consider them to be). Such instances of "misinformation" can be as blunt as a child receiving someone else's report card marks (misinformed about his true grade and thus misperceiving his own academic competence) or as subtle as a child growing up in a social setting where "good" performance is considered as "graduating from high school", as opposed to, say, "getting into a selective college." In the latter case, a child who receives a report card mark of "C" would consider himself to be doing poorly in school, as he would not get into a good college with C's; while the former, who receives a report card mark of "C" would consider himself to be quite good in school, as he would be able to graduate from school with C's.<sup>40</sup> The content of their thought processes might not be exactly as illustrated, but the principle is the same; a child's perception of their academic competence rests on a standard of "good" and "bad" that may or may not align with more objective standard. Any such misalignment, then, is an indication not of a child's selective rejection or opposition of poor evaluations, but of being misinformed about the standard of judgment.

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<sup>39</sup> In some cases, such rejection does not pertain merely to a particular test or grade but manifest itself as voluntary opposition to schooling itself (cf. oppositional culture theory) (e.g., Ogbu 2004).

<sup>40</sup> Another example of "misinformation" could manifest in a child's expectation of what it takes to get into college. A child might think that simply graduating from high school will be enough for him/her to enter a college; while in reality, there is a myriad of information that pertains to the college entrance process, and could help them gain entrance if he/she was sufficiently informed (e.g., Morgan 2005).

This dissertation's findings provide more credence for the "misinformation" conjecture than the "voluntary rejection." Four reasons stand out. One, the study's central hypothesis of racial mismatch was not supported. We expected performance discounting by blacks to be greater in white teacher classrooms than in black teacher classrooms, based on the idea that perceived bias would be greater in white teacher classrooms (cf. Downey & Pribesh 2004; Bates & Glick 2013). This was not shown to be the case. Blacks showed weaker ABAA regardless of their teacher's race. Stereotyping did not appear to matter.

Second, we expected the racial disparity in ABAA to be smaller in 3<sup>rd</sup> grade, *and* grow wider over time, as children's stereotype knowledge increased (e.g., McKown & Weinstein 2009). Again, this was not shown to be true. A large racial gap in ABAA was evident from the outset (3<sup>rd</sup> grade), and this gap remained throughout. This suggests that black children, from a very early age (i.e., perhaps even before becoming stereotype conscious), may already use a subjective evaluation standard that is distinct from that of whites. This, then, is likely to be a matter of socialization within the context of family, and, in particular, parents' roles in shaping children's standards of judgment.

Third, the size of the racial disparity in performance discounting was greater when measuring performance by teacher ratings than by test scores. This, too, was contrary to expectations. Given that blacks would have perceived greater bias from teachers than from impersonal standardized tests, we expected racial gap in ABAA to be greater when measured by teacher ratings than by test scores. Our results showed the opposite. This suggests, then, that blacks' weak ABAA may pertain *less* to the level of

perceived stereotyping and *more* to the saliency and immediacy of performance evaluations (cf. Wylie 1979).<sup>41</sup>

Finally, although blacks' ABAA was weaker than whites' at any given point in time, their academic self-concept responded to changes in their own scores just as strongly as did whites'. Our results showed no racial gap in ABAA when based on within-person variation in achievement. This is, yet again, a sign that blacks are not incorporating voluntary rejection for the sake of protecting their self-concept. Blacks *are* vulnerable to fluctuations of academic self-concept; it is only that their fluctuations occur at higher levels than those of whites at all points in their schooling. If it were the case that blacks discount performance to protect their academic self-concept, then one would think that blacks would reject poor evaluations *at all cost*, whether in comparison to the scores of others or to their own prior scores. However, the results of this dissertation clearly show that such a disengagement of academic self-concept from achievement does not occur. Rather, blacks' weak ABAA is a consequence of low-achieving blacks' positively-biased academic self-concept which is present at all times, likely due to a misalignment in standards of judgment due to *misinformation*.

How, then, can we correctly *inform* these students so that they have accurate academic self-knowledge, and benefit from it in their schooling? This study points to

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<sup>41</sup> For example, a child might have greater difficulty interpreting the *meaning* of achieving 65<sup>th</sup> percentile in a standardized test than, say, receiving "D" in a report card. In the same vein, a child might also have greater difficulty retaining/recalling the previous test scores than the previous teacher rating. That is, a child might more easily recall what he received on his report card (e.g., A, B, C) than the percentile/raw score of standardized tests. This would be an important factor, as Alexander, Entwisle, and Bedinger (1994) presciently showed in their study some 20 years ago, that there is a strong link between children's inflated performance-expectations and their ability to accurately recall their prior semester's report card marks. That is to say, children's overly excessive performance expectations are based on *misinformation* regarding their prior performance. Though Alexander and his colleagues did not examine how children would fare in recalling test scores, as opposed to report card marks, it is probably reasonable to believe that those who could not recall whether they had had received "B" or "C" on their report cards would have had even greater difficulty recalling whether they had received "78<sup>th</sup>" or "67<sup>th</sup>" percentile in some standardized tests.

parents as the key factor in the process. The course of a child's development, including their development of self-concept, is set early in life (e.g., Caspi 2000), and parents are the most proximal, primary agents of shaping this course (e.g., Bronfenbrenner 1986). This means that parents must first be helped to obtain information that aligns their children's academic perceptions to reality. Parents' standard of what it means for their children to be doing "well" or "poorly" academically must be closely in tune with the institutional standards. As Alexander and his colleagues (1994) and others (e.g., Laureau 2002) have suggested, the parents of the disadvantaged children often lack the resources to successfully navigate the academic realm, including the information regarding what it takes to succeed in school and what it means for a child to be doing well in school. Furthermore, if the parents do not know the criteria for school success, it is likely that their children's ability to judge their own performance would be different from those whose parents do know such criteria.<sup>42</sup> Thus, programs to help disadvantaged parents to increase their knowledge of the academic realm could help this cause.

In this regard, especially beneficial would be programs that provide disadvantaged parents with not only support for their children's schooling but also for their own educational achievement—for example, "two-generation" programs (cf. Chase-Lansdale & Brooks-Gunn 2014). Over the years, many two-generation programs have come and gone with limited success (e.g., Project Redistribution, Learning and Earning Programs (LEAP), The Job Opportunity and Basic Study (JOBS), etc., the broad platform

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<sup>42</sup> Knowing the criteria of success, I would contend, does not simply mean that the parents know that "A" is good and "C" is bad but that they know the everyday attitudes and values and efforts that take for a child to succeed in school, as well as their own engagement in their child's education. Such attitudes and values would translate into parents' day-to-day interactions, which the child observes and learns. In this light, it is not necessarily a contradiction to see that blacks' weak ABAA was shown also for parental ratings; parents may know that their child is doing "poorly" but such knowledge may not necessarily translate into something that is informative for a child's setting of their own evaluation standards.

for most being that of Head Start). One criticisms for these programs have been that, though an aim was to provide *both* parents and children with opportunities for educational achievement, the parental side of this goal was often set too low – i.e., not going beyond completing adult basic learning or achieving a GED (Chase-Lansdale & Brooks-Gunn 2014). On the horizon, however, are some of the new two-generation programs (e.g., College Access and Success Program, Advanced Parent-Child Education Program, etc.) that address this issue and have set loftier educational goals for the parents (e.g., postsecondary achievement and professional certifications). These programs attempt to serve the parent’s educational needs with equal intensity as they do with the children’s, and they recognize and address the need for staff expertise in these adult learning efforts (Chase-Lansdale & Brooks-Gunn 2014). Thus, though this dissertation was not written with policy or practice in mind, two-generation programs such as these are strongly recommended. If these parent involvement programs proved to be successful, one of the ways they could succeed could be in no small part due to helping the disadvantaged children being better *informed* about the rigors of institutional standards and expectations for school success. This would allow them to be in a better position to prepare themselves to meet these standards, not through inflated self-confidence, but through accurate and grounded self-assessment of their academic strengths and weaknesses.

Lastly, we come back to the issue of overall self-esteem. For the “perception meets the reality” concept to have net benefit, any downward correction to academic self-assessment ought not negatively influence a child’s overall self-esteem. Despite criticism, the importance of overall self-esteem, especially for the disadvantaged, is still widely

acknowledged (e.g., Cicchetti & Rogosch 1997; Buckner, Mezzacappa, & Beardslee 2003). Additionally, this is only possible if a child's academic self-concept is *detached* from his overall self-esteem. This is an interesting proposition, in that the literature generally views the detached academic self-concept as something negative (a sign of "disidentification"; e.g., Steele et al. 1997). However, is it negative? Should a child's sense of his overall self be determined by what grade he receives on a report card and how well he does in standardized tests? The topic is not within the scope of this study, but this author believes that a child's overall self-esteem should not be tied to their academic self-concept. At the end of the day, a child should be able to comfortably acknowledge both his successes *and* his failures in classrooms, without having to worry about his overall sense of self being affected. It is about positioning oneself where one can take the best next step for change and improvement. Whether the help is available when they take the next step is a whole different matter (cf. Alexander, Entwisle, & Bedinger 1994) but, regardless, the initial position must invariably be the place where one sees himself accurately and recognizes his *need* for help. Family and community practices, as well as teaching practices in classrooms, that promote these elements of self-concept formation are recommended.

## APPENDIX: TABLES

Table 6.1 Variable Description, 3<sup>rd</sup> Grade

VARIABLE	MEAN	STD. DEV	CONTINUOUS/ CATEGORICAL?	
academic self-concept	3.2	0.7	cont.	Child's reading self-concept based on Marsh's Self-Descriptive Questionnaire for reading competence (based on the self-evaluative component, not the interest component). The raw score ranges from 1 to 4.
standardized test score	110.0	18.4	cont.	Child's Item Response Theory (IRT) score for reading.
teacher's rating	3.3	0.8	cont.	Child's ARS score for language and literacy. ECLS-K provides teacher's rating on child's language and literacy proficiency based on the 8 item questions pertaining to teachers' beliefs about the child's reading, writing, and oral skills. The raw score ranges from 1 to 5.
parental rating	3.9	1.0	cont.	Child's parental reading score based on the parental answer to the question on the child's reading ability: "Compared to other students, how well do you think your child is doing in reading?" The raw score ranges from 1-5.
black	23.5%	0.4	binary	Child's race: 0=non-Hisp white, 1=non-Hisp & Hisp black
female	50.4%	0.5	binary	Child's Sex: 0=male, 1=female
family socioeconomic status	0.0	0.8	cont.	Child's family SES based on the composite scale of the parental education, income, and occupation. The scale is ready provided by ECLS-K (standardized).
child's kindergarten test score	33.1	10.3	cont.	Child's Kindergarten cognitive assessment on reading and math.
evern been retained	9.8%	0.3	binary	Child's retention status: 0=never been held back, 1=held back at least once since K
absence (truant or not)	3.6%	0.2	binary	Child's absence level: 0=not truant (unexcused absence less than 10 times a year), 1=truant (unexcused absence 10 or more times)
tardiness (truant or not)	4.5%	0.2	binary	Child's tardiness level: 0=not truant (unexcused tardy less than 10 times), 1=truant (unexcused tardy 10 or more times)
school percent black	19.3%	0.3	cont.	School race composition: the percentage of black students in the school that the child attends.
school percent free lunch	30.3%	0.3	cont.	School SES composition: the percentage of students who are eligible for free lunch in the school that the child attends.
school climate	3.8	0.7	cont.	School Climate: Based on 15 item questions about the four domains of school, (1) academic, (2) discipline, (3) school spirit, and (4) administrative cooperation, as answered by the teacher(s) in the school that the child attends. The raw score ranges from 1 to 5.
teacher's race (black)	9.1%	0.3	binary	Teacher's race: the race of the child's reading teacher. 0=White & all non-black reading teachers, 1=non-Hisp & Hisp black reading teachers
teacher's experience	8.0	7.6	cont.	Teacher's experience: number of years teaching - ranges from 0 to 39 years.
teacher's education	70.8%	0.5	binary	Teacher's educational level: 0=bachelor or less, 1=beyond bachelor
N (obs)	9,391			

Note: Means are survey weighted. Standard deviations are not weighted.

Table 6.2 Weighted Means of the Variables by Race, 3<sup>rd</sup> Grade

VARIABLE	Mean		Stat. Sig. of $\Delta$ , F-test ( $p < 0.05$ )
	WHITE	BLACK	
Academic self-concept	3.2	3.3	ns
Standardized test score	113.5	98.6	*
Teacher's rating	3.4	3.1	*
Parental rating	3.9	3.9	ns
black	-	-	-
female	50.3%	50.5%	ns
Family socioeconomic status	0.2	-0.4	*
Child's kindergaten test score	34.5	28.7	*
Evern been retained (Yes)	8.0%	15.8%	*
Absence (Truant)	2.2%	8.2%	*
Tardiness (Truant)	3.2%	8.6%	*
school pct. black	8.5%	54.1%	*
school pct. free lunch	22.6%	55.3%	*
school climate	3.9	3.6	*
teacher's race (black)	3.1%	28.8%	*
teacher's experience	8.2	7.3	*
teacher's education (beyond BA)	73.3%	62.6%	*
N(obs)	7,502	1,889	

“Stat. Sig. of  $\Delta$ ” indicates the statistical significance for the difference in the means between blacks and whites,  
 \*  $p < 0.05$ .

Table 6.3 Weighted Means of Academic Self-Concept across Achievement Levels (“Low”: Below one standard deviation, “Mid”: Between one standard deviation, “High”: Above one standard deviation) by Race by Achievement Type, 3<sup>rd</sup> Grade

ACHIEVEMENT LEVELS	STANDARD. TEST		Stat.Sig.	TEACHER RATING		Stat.Sig.	PARENT RATING		Stat.Sig.
	White	Black	of Δ	White	Black	of Δ	White	Black	of Δ
LOW	2.85 (0.04)	3.11 (0.04)	*	2.86 (0.03)	3.05 (0.04)	*	2.78 (0.04)	3.01 (0.06)	*
N(obs)	929	696		1,123	532		724	202	
MID	3.21 (0.01)	3.32 (0.02)	*	3.23 (0.01)	3.30 (0.03)	+	3.17 (0.02)	3.19 (0.03)	
N(obs)	5,116	1,127		5,055	1,165		4,234	996	
HIGH	3.59 (0.01)	3.54 (0.08)		3.54 (0.02)	3.56 (0.12)		3.47 (0.01)	3.44 (0.03)	
N(obs)	1,457	66		1,324	192		2,544	691	
ALL	3.23 (0.02)	3.26 (0.02)		3.23 (0.02)	3.26 (0.02)		3.23 (0.02)	3.26 (0.02)	
N(obs)	7,502	1,889		7,502	1,889		7,502	1,889	

“Stat. Sig. of Δ” indicates the statistical significance for the *difference* in the means between blacks and whites, + p<0.10, \* p<0.05

Table 6.4 Bivariate Correlations between Academic Self-Concept and Achievement by Race by Achievement Type, 3<sup>rd</sup> Grade

VARIABLES	Academic Self-concept			Test Scores			Teacher's Rating			Parental Rating	
	White	Black	s.s.Δ	White	Black	s.s.Δ	White	Black	s.s.Δ	White	Black
Academic self-concept	1.00	1.00									
Test scores	0.34	0.20	*	1.00	1.00						
Teacher's rating	0.32	0.24	*	0.64	0.61		1.00	1.00			
Parental rating	0.31	0.24	*	0.46	0.38	*	0.46	0.39	*	1.00	1.00

“s.s.Δ” indicates the statistical significance for the *difference* in the correlations between blacks and whites, \* p<0.05.

Note: Each individual correlation figure is statistically significant (from zero) at p<0.05 level.

Table 6.5 Correlations between Academic Self-Concept and Achievement by Covariates, and the Likelihood<sup>+</sup> of Black Children’s Membership to the Covariates, 3<sup>rd</sup> Grade

VARIABLES	School Pct Black		School Pct Free Lunch		School Climate		Ever Been Retained?		Absence (Truant level?)		Tardiness (Truant level?)	
	More <sup>1</sup> Black	More <sup>1</sup> White Δ	More <sup>2</sup> Poor	More <sup>2</sup> Rich *	Low <sup>3</sup> Climate Δ	High <sup>3</sup> Climate Δ	Yes	No	Yes	No	Yes	No Δ
Test scores	0.17	0.31 *	0.19	0.31 *	0.23	0.31 *	0.14	0.31 *	0.14	0.28 *	0.17	0.27
Teacher’s rating	0.24	0.31 *	0.26	0.34 *	0.28	0.30 *	0.21	0.31 *	0.20	0.29 *	0.21	0.29
Parental rating	0.29	0.30	0.27	0.32 *	0.28	0.32 *	0.29	0.29	0.33	0.30	0.27	0.29
N(obs)	2,522	6,869	3,450	5,941	3,855	5,536	733	8,658	298	9,093	388	9,003
Blacks are more likely to be in:	Y		Y		Y		Y		Y		Y	
By what factors (vs. whites)? <sup>+</sup>	30 x		11 x		3 x		2 x		4 x		3 x	

<sup>1</sup> “More Black” indicates those children who attend schools whose percentage of black students is greater than the sample mean school pct. black (19.3%) while “More White” less than or equal to the sample mean.

<sup>2</sup> “More Poor” indicates those children who attend schools whose percentage of students eligible for free lunch is greater than the sample mean school pct. free lunch (30.3%) while “More Rich” less than or equal to the sample mean.

<sup>3</sup> “Low Climate” indicates those children who attend schools whose school climate is lower than the sample mean school climate while the “High Climate” greater than or equal to the sample mean (3.8).

<sup>+</sup> Based on the odds ratio from the weighted logit regressions of each covariate variable (e.g., Retained) on child’s race.

Δ indicates statistical significance for the *difference* in the correlation between blacks and whites, \* p<0.05. Note: Each individual correlation figure is statistically significant (from zero) at 5% significance level.

Table 6.6 OLS Regression Estimates of Racial Disparity in the Association between Academic Self-Concept & Test Score, with Comparison to Other Model Estimates, 3<sup>rd</sup> Grade (N=9391)

		OLS, robust std.err.			Additional Model Strategies		
		m1	m2	m3	Tobit	RE	FE
<b>RACE</b>							
	Black	0.248 *	0.240 *	0.135 *	0.137 *	0.152 *	0.184 *
		(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)
<b>ACHIEVEMENT</b>							
	Test score	0.355 *	0.351 *	0.376 *	0.377 *	0.388 *	0.396 *
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
<b>RACE X ACHIEVEMENT</b>							
	Black * Test Score	-0.153 *	-0.152 *	-0.113 *	-0.115 *	-0.112 *	-0.086 *
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
<b>DEMOGRAPHIC</b>							
	female		Y	Y	Y	Y	Y
	family SES		Y	Y	Y	Y	Y
	Cognitive score at K		Y	Y	Y	Y	Y
<b>SOCIAL COMPARISON</b>							
	School % black		Y	Y	Y	Y	Y
	School % lunch		Y	Y	Y	Y	Y
	School Climate		Y	Y	Y	Y	Y
<b>DISIDENTIFICATION</b>							
	Retention		Y	Y	Y	Y	Y
	Absence		Y	Y	Y	Y	Y
	Tardiness		Y	Y	Y	Y	Y
	R <sup>2</sup>	0.09	0.09	0.10			

(1) The standard errors in the OLS models are computed with Huber-White sandwich variance estimator, adjusted for cluster design of the sample; (2) For Tobit model, the lower bound of 1 and the upper bound of 4 were used; (3) For Random Effect model, a random intercept with second-level predictors (school contexts) and an unconditional random slope for the test score were used. A sequential model building was used to confirm the final model specification. The information criteria test (BIC) indicated that the second-level predictors for random slope were superfluous, and thus were dropped from the final model; (4) For Fixed Effect model, fixed effect for each of the 2,077 schools in the analytic sample is included—which is akin to including a dummy variable for each school children attended. The estimates for this model represent solely the within-individual est.; as such, the variables for school composition/climate were not included in the FE model; (5) Supplementary regressions with survey weights were run (not shown). The result for the fully specified models did not significantly differ from those of the above; (6) Academic self-concept and the achievement variables were standardized for the above analysis. A careful checking of the estimates across non-standardized & standardized models indicated that the only substantial difference between the two models is in the inflated t-statistic for the constant (intercept) in the non-standardized model. For all other variables, t-stat and p-values remain identical between the two models; (8) The R-squared values are based on a single imputed dataset. All other estimates are based on the multiply imputed data—except the estimates for Tobit model; (9) \* indicates  $p < 0.05$ .

Table 6.7 Comparison of Regression Estimates of the Racial Disparity in the Association of Academic Self-Concept and Achievement by Achievement Types (Test score, Teacher's rating, & Parental rating), for OLS and Fixed Effect Model Estimates, 3rd Grade (N=9391)

	O L S, robust std.err.			F E		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>RACE</b>						
Black	0.135 *	0.132 *	0.053	0.184 *	0.173 *	0.079
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
<b>ACHIEVEMENT</b>						
Ach.	0.376 *	0.305 *	0.273 *	0.396 *	0.331 *	0.257 *
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
<b>RACE X ACHIEVEMENT</b>						
Black * Ach.	<b>-0.113 *</b>	<b>-0.072 *</b>	<b>-0.061 *</b>	<b>-0.086 *</b>	<b>-0.088 *</b>	<b>-0.078 *</b>
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
<b>DEMOGRAPHIC</b>						
	Y	Y	Y	Y	Y	Y
<b>SOCIAL COMPARISON</b>						
	Y	Y	Y			
<b>DISIDENTIFICATION</b>						
	Y	Y	Y	Y	Y	Y
<i>P-value for the test statistic:</i>						
<i>Black * Ach. = 0</i>	0.00	0.00	0.04	0.00	0.00	0.01

Table 6.8 The Association of Child-Teacher's Race with Achievement by Achievement Type, for OLS and Fixed Effect, 3<sup>rd</sup> Grade (N=9391)

	O L S, robust std.err.			F E		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.377 *	0.306 *	0.272 *	0.396 *	0.330 *	0.256 *
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref	ref	ref	ref
(2) White-Black	0.112	0.041	0.112	0.039	-0.044	0.031
	(0.09)	(0.10)	(0.08)	(0.10)	(0.11)	(0.11)
(3) Black-White	0.127 *	0.130 *	0.051	0.174 *	0.167 *	0.072
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
(4) Black-Black	0.276 *	0.224 *	0.147 *	0.300 *	0.231 *	0.171 *
	(0.07)	(0.07)	(0.07)	(0.10)	(0.09)	(0.09)
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref	ref	ref	ref
(b) White-Black * Ach.	-0.018	-0.024	0.019	0.030	0.040	0.032
	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)	(0.10)
(c) Black-White * Ach.	-0.118 *	-0.065 *	-0.079 *	-0.090 *	-0.083 *	-0.095 *
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
(d) Black-Black * Ach.	-0.097 *	-0.099 *	-0.017	-0.075	-0.101 *	-0.040
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
<b>ALL COVARIATES</b>						
	Υ	Υ	Υ	Υ	Υ	Υ
P-value for the test statistics:						
(1) vs (2)	0.23	0.67	0.17	0.71	0.69	0.77
(1) vs (3)	0.00	0.00	0.21	0.00	0.00	0.12
(1) vs (4)	0.00	0.00	0.03	0.00	0.01	0.07
(2) vs (3)	0.88	0.37	0.48	0.22	0.07	0.71
(2) vs (4)	0.13	0.09	0.72	0.05	0.04	0.28
(3) vs (4)	0.03	0.12	0.12	0.20	0.07	0.26
P-value for the test statistics:						
(a) vs (b)	0.84	0.77	0.83	0.73	0.67	0.74
(a) vs (c)	0.00	0.06	0.02	0.01	0.03	0.01
(a) vs (d)	0.06	0.04	0.78	0.16	0.04	0.51
(b) vs (c)	0.28	0.64	0.30	0.19	0.19	0.19
(b) vs (d)	0.42	0.42	0.72	0.29	0.17	0.51
(c) vs (d)	0.74	0.57	0.38	0.81	0.19	0.42

(1). Child-Teacher race is constructed from 2x2 table of child race (white, black) and teacher's race (white teacher; black teacher). For example, "White-Black" indicates white student in black teacher classroom.  
(2). "All covariates" include the covariates for demography, social comparison, disidentification, as well as teacher's experience and education. (3) All regression estimates are based on multiply imputed data.

Table 6.9 The Association of Child-Teacher's Race with Achievement by School Percentage of Black Students, OLS with robust standard errors, 3<sup>rd</sup> Grade (N=9391)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.389 *	0.320 *	0.293 *			
	(0.02)	(0.02)	(0.02)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	0.094	0.057	0.131	(1) vs (2)	0.33	0.55
	(0.10)	(0.10)	(0.08)	(1) vs (3)	0.02	0.01
(3) Black-White	0.102 *	0.111 *	0.036	(1) vs (4)	0.03	0.01
	(0.04)	(0.04)	(0.04)	(2) vs (3)	0.94	0.59
(4) Black-Black	0.297 *	0.266 *	0.208 *	(2) vs (4)	0.21	0.13
	(0.13)	(0.11)	(0.11)	(3) vs (4)	0.16	0.17
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	0.002	-0.034	0.023	(a) vs (b)	0.98	0.69
	(0.09)	(0.09)	(0.09)	(a) vs (c)	0.00	0.03
(c) Black-White * Ach.	-0.174 *	-0.103 *	-0.089 *	(a) vs (d)	0.15	0.44
	(0.05)	(0.05)	(0.05)	(b) vs (c)	0.09	0.48
(d) Black-Black * Ach.	-0.185	-0.100	-0.145	(b) vs (d)	0.23	0.66
	(0.13)	(0.13)	(0.14)	(c) vs (d)	0.93	0.98
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	-0.211 *	-0.151	-0.179 *	(a) vs (b)	0.03	0.27
	(0.10)	(0.14)	(0.10)	(a) vs (c)	0.07	0.42
(c) Black-White * Ach * School	-0.074 *	-0.033	-0.059	(a) vs (d)	0.28	0.38
	(0.04)	(0.04)	(0.04)	(b) vs (c)	0.15	0.39
(d) Black-Black * Ach * School	-0.067	-0.056	0.004	(b) vs (d)	0.16	0.49
	(0.06)	(0.06)	(0.07)	(c) vs (d)	0.91	0.72
<b>ALL COVARIATES</b>						
	Y	Y	Y			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher's characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school's percentage of black students. A high value indicates a high percentage of black students. (3) All regression estimates are based on multiply imputed data.

Table 6.10 The Association of Child-Teacher’s Race with Achievement by School Percentage of Free Lunch Eligible Students, OLS with robust standard errors, 3<sup>rd</sup> Grade (N=9391)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.350 *	0.299 *	0.267 *			
	(0.02)	(0.02)	(0.01)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	0.072	0.039	0.114	(1) vs (2)	0.44	0.67
	(0.09)	(0.09)	(0.08)	(1) vs (3)	0.03	0.04
(3) Black-White	0.092 *	0.089 *	0.034	(1) vs (4)	0.04	0.04
	(0.04)	(0.04)	(0.04)	(2) vs (3)	0.83	0.59
(4) Black-Black	0.197 *	0.190 *	0.153	(2) vs (4)	0.33	0.23
	(0.10)	(0.09)	(0.10)	(3) vs (4)	0.27	0.28
					0.22	0.22
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	0.051	-0.008	0.041	(a) vs (b)	0.58	0.93
	(0.09)	(0.08)	(0.09)	(a) vs (c)	0.00	0.01
(c) Black-White * Ach.	-0.193 *	-0.126 *	-0.079 *	(a) vs (d)	0.02	0.09
	(0.04)	(0.04)	(0.04)	(b) vs (c)	0.01	0.21
(d) Black-Black * Ach.	-0.214 *	-0.160 *	-0.079	(b) vs (d)	0.05	0.24
	(0.09)	(0.09)	(0.10)	(c) vs (d)	0.83	0.74
					1.00	1.00
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	-0.083	-0.073	-0.054	(a) vs (b)	0.33	0.38
	(0.09)	(0.08)	(0.08)	(a) vs (c)	0.01	0.03
(c) Black-White * Ach * School	0.089 *	0.075 *	0.024	(a) vs (d)	0.16	0.52
	(0.03)	(0.03)	(0.03)	(b) vs (c)	0.05	0.09
(d) Black-Black * Ach * School	0.074	0.040	0.061	(b) vs (d)	0.11	0.23
	(0.05)	(0.06)	(0.07)	(c) vs (d)	0.79	0.60
					0.61	0.61
<b>ALL COVARIATES</b>						
	Y	Y	Y			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher's characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school's percentage of eligible students for free lunch. It is inversely related to school SES. A high value indicates a low school SES. (3) All regression estimates are based on multiply imputed data.

Table 6.11 The Association of Child-Teacher's Race with Achievement by School Climate, OLS with robust standard errors, 3<sup>rd</sup> Grade (N=9391)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.353 *	0.302 *	0.271 *			
	(0.02)	(0.02)	(0.01)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	0.123	0.051	0.111	(1) vs (2)	0.17	0.58
	(0.09)	(0.09)	(0.08)	(1) vs (3)	0.01	0.00
(3) Black-White	0.113 *	0.125 *	0.049	(1) vs (4)	0.00	0.00
	(0.04)	(0.04)	(0.04)	(2) vs (3)	0.92	0.44
(4) Black-Black	0.261 *	0.237 *	0.157 *	(2) vs (4)	0.20	0.08
	(0.08)	(0.07)	(0.07)	(3) vs (4)	0.04	0.08
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	-0.010	-0.004	0.011	(a) vs (b)	0.90	0.96
	(0.08)	(0.08)	(0.09)	(a) vs (c)	0.00	0.02
(c) Black-White * Ach.	-0.145 *	-0.082 *	-0.071 *	(a) vs (d)	0.02	0.01
	(0.04)	(0.04)	(0.04)	(b) vs (c)	0.14	0.38
(d) Black-Black * Ach.	-0.133 *	-0.135 *	-0.029	(b) vs (d)	0.22	0.15
	(0.06)	(0.05)	(0.06)	(c) vs (d)	0.86	0.40
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	-0.108	-0.125	-0.094 *	(a) vs (b)	0.17	0.10
	(0.08)	(0.08)	(0.08)	(a) vs (c)	0.18	0.48
(c) Black-White * Ach * School	-0.048	-0.024	0.004	(a) vs (d)	0.29	0.28
	(0.04)	(0.03)	(0.04)	(b) vs (c)	0.48	0.19
(d) Black-Black * Ach * School	-0.044	-0.043	-0.038	(b) vs (d)	0.45	0.32
	(0.04)	(0.04)	(0.04)	(c) vs (d)	0.94	0.71
<b>ALL COVARIATES</b>						
	∩	∩	∩			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher's characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school's percentage of eligible students for free lunch. It is inversely related to school SES. A high value indicates a low school SES. (3) All regression estimates are based on multiply imputed data.

Table 6.12 Distribution of Children by School Composition and Climate, 3<sup>rd</sup> Grade

School Pct. Black

		"More White" <sup>1</sup>	"More Black" <sup>1</sup>	Total
School Pct.	"More Rich" <sup>2</sup>	5,380	561	5,941
Free Lunch	"More Poor" <sup>2</sup>	1,489	1,961	3,450
	Total	6,869	2,522	9,391

School Pct. Black

		"More White" <sup>1</sup>	"More Black" <sup>1</sup>	Total
School	"Hi Climate" <sup>1</sup>	4,432	1,104	5,536
Climate	"Lo Climate" <sup>2</sup>	2,437	1,418	3,855
	Total	6,869	2,522	9,391

School Climate

		"Hi Climate" <sup>1</sup>	"Lo Climate" <sup>1</sup>	Total
School Pct.	"More Rich" <sup>2</sup>	4,032	1,909	5,941
Free Lunch	"More Poor" <sup>2</sup>	1,504	1,946	3,450
	Total	5,536	3,855	9,391

<sup>1</sup> "More Black" indicates those children who attend schools whose percentage of black students is greater than the sample mean school pct. black (19.3%) while "More White" less than or equal to the sample mean.

<sup>2</sup> "More Poor" indicates those children who attend schools whose percentage of students eligible for free lunch is greater than the sample mean school pct. free lunch (30.3%) while "More Rich" less than or equal to the sample mean.

<sup>3</sup> "Lo Climate" indicates those children who attend schools whose school climate is lower than the sample mean school climate while the "Hi Climate" greater than or equal to the sample mean (3.8).

Note: Based on one imputed dataset.

Table 7.1 Variable Description, 8<sup>th</sup> Grade

VARIABLE	MEAN	STD. DEV	CONTINUOUS/ CATEGORICAL?	
academic self-concept	2.8	0.6	cont.	Child's English self-concept based on Marsh's Self-Descriptive Questionnaire for English competence (based on the self-evaluative component, not the interest component). The raw score ranges from 1 to 4.
standardized test score	142.5	17.5	cont.	Child's Item Response Theory (IRT) score for reading.
teacher's rating	3.1	0.8	cont.	Child's ARS score for language and literacy. ECLS-K provides teacher's rating on child's language and literacy proficiency based on the 8 item questions pertaining to teachers' beliefs about the child's reading, writing, and oral skills. In 8th grade, a greater emphasis was put on writing and oral components. The raw score ranges from 1 to 5.
parental rating	3.3	0.7	cont.	Based on parental interview questions: "Now I would like to ask you about child's grade during this school year. Overall, across all subject the child takes, does he/she get..." In 3rd grade, parents were asked to answer specifically on child's reading competence but in 8th grade on all subjects. The raw score ranges from 1 to 5
black	24.5%	0.4	binary	Child's race: 0=non-Hisp white, 1=non-Hisp & Hisp black
female	49.3%	0.5	binary	Child's Sex: 0=male, 1=female
family socioeconomic status	0.0	0.8	cont.	Child's family SES based on the composite scale of the parental education, income, and occupation. The scale is ready provided by ECLS-K (standardized).
child's kindergarten test score	33.8	10.1	cont.	Child's Kindergarten cognitive assessment on reading and math.
evern been retained	12.2%	0.3	binary	Child's retention status: 0=never been held back, 1=held back at least once since K
school percent black	19.6%	0.2	cont.	School race composition: the percentage of black students in the school that the child attends.
schoo percent free lunch	32.5%	0.2	cont.	School SES composition: the percentage of students who are eligible for free lunch in the school that the child attends.
school climate	3.7	0.4	cont.	School Climate: Based on 15 item questions about the four domains of school, (1) academic, (2) discipline, (3) school spirit, and (4) administrative cooperation, as answered by the teacher(s) in the school that the child attends. The raw score ranges from 1 to 5.
teacher's race (black)	15.4%	0.3	binary	Teacher's race: the race of the child's reading teacher. 0=White & all non-black reading teachers, 1=non-Hisp & Hisp black reading teachers
teacher's experience	13.5	8.0	cont.	Teacher's experience: number of years teaching - ranges from 0 to 39 years.
teacher's education	77.5%	0.3	binary	Teacher's educational level: 0=bachelor or less, 1=beyond bachelor
N (obs)	6,145			

Note: Means are survey weighted. Standard deviations are not weighted.

Table 7.2 Weighted Means of the Variables by Race, 8<sup>th</sup> Grade

VARIABLE	Mean		Stat.Sig. of $\Delta$ , F-test ( $p < 0.05$ )
	WHITE	BLACK	
Academic self-concept	2.8	2.7	ns
Standardized test score	178.0	153.2	*
Teacher's rating	3.3	2.8	*
Parental rating	3.4	2.9	*
black	0.00	1.00	-
female	49.0%	50.2%	ns
Family socioeconomic status	0.2	-0.4	*
Child's kindergaten test score	35.6	28.4	*
Even been retained (Yes)	8.9%	22.4%	*
school pct. black	9.3%	51.5%	*
school pct. free lunch	26.2%	51.6%	*
school climate	3.8	3.7	*
teacher's race (black)	4.4%	33.1%	*
teacher's experience	14.7	12.7	*
teacher's education (beyond BA)	78.8%	77.5%	ns
N(obs)	5,212	933	

“Stat. Sig. of  $\Delta$ ” indicates the statistical significance for the difference in the means between blacks and whites,

\*  $p < 0.05$ .

Table 7.3 Weighted Means of Academic Self-Concept across Achievement Levels (“Low”: Below one standard deviation, “Mid”: Between one standard deviation, “High”: Above one standard deviation) by Race by Achievement Type, 8<sup>th</sup> Grade

ACHIEVEMENT LEVELS	STANDARD. TEST		Stat.Sig.	TEACHER RATING		Stat.Sig.	PARENT RATING		Stat.Sig.
	White	Black	of Δ	White	Black	of Δ	White	Black	of Δ
LOW	2.38 (0.06)	2.57 (0.08)	*	2.20 (0.04)	2.40 (0.09)	+	2.31 (0.06)	2.55 (0.09)	*
N(obs)	575	400		777	301		548	226	
MID	2.81 (0.02)	2.87 (0.06)		2.83 (0.02)	2.88 (0.04)		2.88 (0.02)	2.82 (0.05)	
N(obs)	3,948	502		3,542	558		4,606	696	
HIGH	3.35 (0.03)	3.40 (0.13)		3.43 (0.02)	3.50 (0.12)		3.38 (0.07)	3.21 (0.18)	
N(obs)	689	31		893	74		58	11	
ALL	2.82 (0.02)	2.74 (0.03)		2.82 (0.02)	2.74 (0.03)		2.82 (0.02)	2.74 (0.03)	
N(obs)	5,212	933		5,212	933		5,212	933	

“Stat. Sig. of Δ” indicates the statistical significance for the *difference* in the means between blacks and whites, + p<0.10, \* p<0.05

Table 7.4 Weighted Bivariate Correlations between Academic Self-Concept and Achievement by Race by Achievement Type, 8<sup>th</sup> Grade

VARIABLES	Academic Self-concept			Test Scores			Teacher's Rating			Parental Rating	
	White	Black	s.s.Δ	White	Black	s.s.Δ	White	Black	s.s.Δ	White	Black
Academic self-concept	1.00	1.00									
Test scores	0.37	0.17	*	1.00	1.00						
Teacher's rating	0.48	0.34	*	0.59	0.42	*	1.00	1.00			
Parental rating	0.35	0.18	*	0.52	0.39	*	0.53	0.39	*	1.00	1.00

“s.s.Δ” indicates the statistical significance for the *difference* in the correlations between blacks and whites, \* p<0.05.

Note: Each individual correlation figure is statistically significant (from zero) at p<0.05 level.

Table 7.5 Correlations between Academic Self-Concept and Achievement by Covariates, and the Likelihood<sup>+</sup> of Black Children's Membership to the Covariates, 8<sup>th</sup> Grade

VARIABLES	Correlation with Academic Self Concept											
	School Pct Black			School Pct Free Lunch			School Climate			Ever Been Retained?		
	More <sup>1</sup> Black	More <sup>1</sup> White	Δ	More <sup>2</sup> Poor	More <sup>2</sup> Rich	Δ	Low <sup>3</sup> Climate	High <sup>3</sup> Climate	Δ	Yes	No	Δ
Test scores	0.18	0.39	*	0.18	0.36	*	0.21	0.32	*	0.24	0.31	+
Teacher's rating	0.34	0.50	*	0.35	0.48	*	0.40	0.41		0.38	0.45	
Parental rating	0.21	0.36	*	0.24	0.33	*	0.28	0.29		0.26	0.32	
N(obs)	1,567	1,636		1,655	1,514		1,567	1,554		491	5,654	
Blacks are more likely to be in:	Y			Y			Y			Y		
By what factors (vs. whites)? <sup>+</sup>	25 x			7 x			2 x			3 x		

<sup>1</sup> "More Black" indicates those children who attend schools whose percentage of black students is greater than top 75 percentile of the sample while "More White" less than or equal to bottom 25 percentile.

<sup>2</sup> "More Poor" indicates those children who attend schools whose percentage of students eligible for free lunch is greater than the top 75 percentile of the sample while "More Rich" less than or equal to the bottom 25 percentile.

<sup>3</sup> "Low Climate" indicates those children who attend schools whose school climate is lower than the bottom 25 percentile of the sample while the "High Climate" greater than or equal to the 75 percentile.

<sup>+</sup> Based on the odds ratio from the logit regressions of each covariate variable on child's race.

Δ indicates statistical significance for the *difference* in the correlation between blacks and whites, \* p<0.05.

Note: Each individual correlation figure is statistically significant (from zero) at 5% significance level.

Table 7.6 OLS Regression Estimates of Racial Disparity in the Association between Academic Self-Concept & Test Score, with Comparison to Other Model Estimates, 8<sup>th</sup> Grade (N=6145)

		OLS, robust std.err.			Additional Model Strategies		
		m1	m2	m3	Tobit	RE	FE
<b>RACE</b>							
	Black	0.154 *	0.183 *	0.080	0.088	0.098 *	0.048
		(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.07)
<b>ACHIEVEMENT</b>							
	Test score	0.384 *	0.308 *	0.306 *	0.314 *	0.318 *	0.321 *
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
<b>RACE X ACHIEVEMENT</b>							
	Black * Test Score	-0.211 *	-0.194 *	-0.175 *	-0.176 *	-0.149 *	-0.142 *
		(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
<b>DEMOGRAPHIC</b>							
	female		Y	Y	Y	Y	Y
	family SES		Y	Y	Y	Y	Y
	Cognitive score at K		Y	Y	Y	Y	Y
<b>SOCIAL COMPARISON</b>							
	School % black		Y	Y	Y	Y	Y
	School % free lunch		Y	Y	Y	Y	Y
	School Climate		Y	Y	Y	Y	Y
<b>DISIDENTIFICATION</b>							
	Retained		Y	Y	Y	Y	Y
	R <sup>2</sup>	0.10	0.13	0.14			

(1) The standard errors in the OLS models are computed with Huber-White sandwich variance estimator, adjusted for cluster design of the sample; (2) For Tobit model, the lower bound of 1 and the upper bound of 4 were used; (3) For Random Effect model, a random intercept with second-level predictors (school contexts) and an unconditional random slope for the test score were used. A sequential model building was used to confirm the final model specification. The information criteria test (BIC) indicated that the second-level predictors for random slope were superfluous, and thus were dropped from the final model; (4) For Fixed Effect model, fixed effect for each school in the analytic sample is included—which is akin to including a dummy variable for each school children attended. The estimates for this model represent solely the within-individual est.; as such, the variables for school composition/climate were not included in the FE model; (5) Supplementary regressions with survey weights were run (not shown). The result for the fully specified models did not significantly differ from those of the above; (6) Academic self-concept and the achievement variables were standardized for the above analysis. A careful checking of the estimates across non-standardized & standardized models indicated that the only substantial difference between the two models is in the inflated t-statistic for the constant (intercept) in the non-standardized model. For all other variables, t-stat and p-values remain identical between the two models; (8) The R-squared values are based on a single imputed dataset. All other estimates are based on the multiply imputed data—except the estimates for Tobit model; (9) \* indicates  $p < 0.05$ .

Table 7.7 Comparison of Regression Estimates of the Racial Disparity in the Association of Academic Self-Concept and Achievement by Achievement Types (Test score, Teacher's rating, & Parental rating), for OLS and Fixed Effect Model Estimates, 8th Grade (N=6145)

	O L S, robust std.err.			F E		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>RACE</b>						
Black	0.080 (0.05)	0.135 * (0.05)	0.076 (0.05)	0.048 (0.07)	0.088 (0.06)	0.030 (0.06)
<b>ACHIEVEMENT</b>						
Ach.	0.306 * (0.02)	0.435 * (0.02)	0.266 * (0.02)	0.321 * (0.02)	0.437 * (0.02)	0.263 * (0.02)
<b>RACE X ACHIEVEMENT</b>						
Black * Ach.	<b>-0.175 *</b> (0.04)	<b>-0.136 *</b> (0.04)	<b>-0.142 *</b> (0.03)	<b>-0.142 *</b> (0.04)	<b>-0.131 *</b> (0.04)	<b>-0.128 *</b> (0.04)
<b>DEMOGRAPHIC</b>						
	Y	Y	Y	Y	Y	Y
<b>SOCIAL COMPARISON</b>						
	Y	Y	Y			
<b>DISIDENTIFICATION</b>						
	Y	Y	Y	Y	Y	Y
<i>P-value for the test statistic:</i>						
<i>Black * Ach. = 0</i>	0.00	0.00	0.00	0.00	0.00	0.00

Table 7.8 The Association of Child-Teacher's Race with Achievement by Achievement Type, for OLS and Fixed Effect, 8<sup>th</sup> Grade (N=6145)

	O L S, robust std.err.			F E		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.305 *	0.431 *	0.268 *	0.317 *	0.434 *	0.266 *
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref	ref	ref	ref
(2) White-Black	-0.138	-0.086	-0.121	-0.188	-0.083	-0.116
	(0.09)	(0.08)	(0.09)	(0.13)	(0.13)	(0.13)
(3) Black-White	0.076	0.128 *	0.057	0.072	0.115 +	0.040
	(0.06)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)
(4) Black-Black	0.033	0.167 +	0.084	-0.194	-0.090	-0.142
	(0.11)	(0.10)	(0.11)	(0.18)	(0.17)	(0.18)
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref	ref	ref	ref
(b) White-Black * Ach.	0.037	0.115	-0.067	0.118	0.126	-0.076
	(0.10)	(0.09)	(0.09)	(0.11)	(0.10)	(0.09)
(c) Black-White * Ach.	-0.146 *	-0.097 *	-0.135 *	-0.102 *	-0.067	-0.107 *
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
(d) Black-Black * Ach.	-0.212 *	-0.197 *	-0.154 *	-0.214 *	-0.248 *	-0.182 *
	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
<b>ALL COVARIATES</b>						
	∩	∩	∩	∩	∩	∩
P-value for the test statistics:						
(1) vs (2)	0.12	0.26	0.16	0.16	0.52	0.39
(1) vs (3)	0.18	0.01	0.29	0.31	0.08	0.55
(1) vs (4)	0.77	0.08	0.42	0.28	0.59	0.42
(2) vs (3)	0.03	0.01	0.06	0.08	0.15	0.28
(2) vs (4)	0.20	0.02	0.10	0.98	0.96	0.89
(3) vs (4)	0.69	0.66	0.78	0.15	0.23	0.31
P-value for the test statistics:						
(a) vs (b)	0.69	0.19	0.46	0.26	0.20	0.38
(a) vs (c)	0.00	0.01	0.00	0.04	0.18	0.04
(a) vs (d)	0.00	0.00	0.01	0.00	0.00	0.01
(b) vs (c)	0.07	0.03	0.50	0.05	0.08	0.75
(b) vs (d)	0.02	0.00	0.42	0.01	0.00	0.34
(c) vs (d)	0.33	0.20	0.78	0.19	0.03	0.38

(1). Child-Teacher race is constructed from 2x2 table of child race (white, black) and teacher's race (white teacher, black teacher). For example, "White-Black" indicates white student in black teacher classroom.  
(2). "All covariates" include the covariates for demography, social comparison, disidentification, as well as teacher's experience and education. (3) All regression estimates are based on multiply imputed data.

Table 7.9 The Association of Child-Teacher's Race with Achievement by School Percentage of Black Students, OLS with robust standard errors, 8<sup>th</sup> Grade (N=6145)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.303 *	0.421 *	0.260 *			
	(0.02)	(0.02)	(0.02)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	-0.107	-0.082	-0.097	(1) vs (2)	0.28	0.34
	(0.10)	(0.08)	(0.10)	(1) vs (3)	0.08	0.01
(3) Black-White	0.106 *	0.139 *	0.085	(1) vs (4)	0.71	0.72
	(0.06)	(0.05)	(0.06)	(2) vs (3)	0.06	0.02
(4) Black-Black	-0.096	-0.088	-0.332	(2) vs (4)	0.97	0.98
	(0.26)	(0.25)	(0.23)	(3) vs (4)	0.45	0.37
					0.09	0.36
					0.08	0.08
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	0.002	0.097	-0.046	(a) vs (b)	0.99	0.31
	(0.11)	(0.10)	(0.11)	(a) vs (c)	0.02	0.27
(c) Black-White * Ach.	-0.123 *	-0.057	-0.088 *	(a) vs (d)	0.74	0.79
	(0.05)	(0.05)	(0.05)	(b) vs (c)	0.29	0.16
(d) Black-Black * Ach.	0.057	0.053	-0.163	(b) vs (d)	0.79	0.83
	(0.17)	(0.19)	(0.21)	(c) vs (d)	0.32	0.59
					0.73	0.73
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	0.057	0.083	0.007	(a) vs (b)	0.56	0.36
	(0.10)	(0.09)	(0.12)	(a) vs (c)	0.52	1.00
(c) Black-White * Ach * School	-0.028	0.000	-0.017	(a) vs (d)	0.18	0.47
	(0.04)	(0.04)	(0.05)	(b) vs (c)	0.40	0.37
(d) Black-Black * Ach * School	-0.086	-0.054	0.034	(b) vs (d)	0.18	0.21
	(0.06)	(0.07)	(0.07)	(c) vs (d)	0.38	0.49
					0.51	0.51
<b>ALL COVARIATES</b>						
	Y	Y	Y			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher's characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school's percentage of black students. A high value indicates a high percentage of black students. (3) All regression estimates are based on multiply imputed data.

Table 7.10 The Association of Child-Teacher’s Race with Achievement by School Percentage of Free Lunch Eligible Students, OLS with robust standard errors, 8<sup>th</sup> Grade (N=6145)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.301 *	0.426 *	0.264 *			
	(0.02)	(0.02)	(0.02)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	-0.183 *	-0.095	-0.142	(1) vs (2)	0.05	0.23
	(0.09)	(0.08)	(0.09)	(1) vs (3)	0.14	0.02
(3) Black-White	0.086	0.126 *	0.053	(1) vs (4)	0.93	0.44
	(0.06)	(0.05)	(0.06)	(2) vs (3)	0.01	0.01
(4) Black-Black	-0.016	0.117	0.011	(2) vs (4)	0.41	0.20
	(0.18)	(0.15)	(0.18)	(3) vs (4)	0.58	0.95
					0.82	0.82
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	0.125	0.136	0.007	(a) vs (b)	0.29	0.11
	(0.12)	(0.09)	(0.10)	(a) vs (c)	0.00	0.20
(c) Black-White * Ach.	-0.134 *	-0.061	-0.147 *	(a) vs (d)	0.08	0.15
	(0.05)	(0.05)	(0.05)	(b) vs (c)	0.04	0.05
(d) Black-Black * Ach.	-0.233 *	-0.213	-0.191	(b) vs (d)	0.05	0.04
	(0.13)	(0.15)	(0.15)	(c) vs (d)	0.49	0.32
					0.77	0.77
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	-0.043	-0.009	-0.092	(a) vs (b)	0.69	0.92
	(0.11)	(0.09)	(0.09)	(a) vs (c)	0.60	0.70
(c) Black-White * Ach * School	0.022	-0.015	0.049	(a) vs (d)	0.39	0.54
	(0.04)	(0.04)	(0.04)	(b) vs (c)	0.55	0.96
(d) Black-Black * Ach * School	0.055	0.042	0.048	(b) vs (d)	0.42	0.65
	(0.06)	(0.07)	(0.07)	(c) vs (d)	0.65	0.45
					0.99	0.99
<b>ALL COVARIATES</b>						
	Y	Y	Y			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher’s characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school’s percentage of eligible students for free lunch. It is inversely related to school SES. A high value indicates a low school SES. (3) All regression estimates are based on multiply imputed data.

Table 7.11 The Association of Child-Teacher’s Race with Achievement by School Climate, OLS with robust standard errors, 8<sup>th</sup> Grade (N=6145)

	O L S, robust std.err.			P-value for the test statistics		
	Ach. Measures			Ach. Measures		
	Test Score	Teach Rating	Parent Rating	Test Score	Teach Rating	Parent Rating
<b>ACHIEVEMENT</b>						
Ach.	0.304 *	0.431 *	0.268 *			
	(0.02)	(0.02)	(0.02)			
<b>CHILD--TEACHER RACE</b>						
(1) White-White	ref	ref	ref			
				Comparison		
(2) White-Black	-0.135	-0.073	-0.121	(1) vs (2)	0.13	0.35
	(0.09)	(0.08)	(0.09)	(1) vs (3)	0.15	0.01
(3) Black-White	0.083	0.137 *	0.068	(1) vs (4)	0.81	0.12
	(0.06)	(0.05)	(0.06)	(2) vs (3)	0.03	0.02
(4) Black-Black	0.028	0.154	0.056	(2) vs (4)	0.23	0.05
	(0.11)	(0.10)	(0.11)	(3) vs (4)	0.62	0.85
					0.91	
<b>CHILD-TEACHER RACE X ACHIEVEMENT</b>						
(a) White-White * Ach.	ref	ref	ref			
				Comparison		
(b) White-Black * Ach.	0.034	0.121	-0.062	(a) vs (b)	0.72	0.15
	(0.10)	(0.08)	(0.09)	(a) vs (c)	0.00	0.06
(c) Black-White * Ach.	-0.130 *	-0.081 *	-0.123 *	(a) vs (d)	0.01	0.04
	(0.04)	(0.04)	(0.04)	(b) vs (c)	0.11	0.04
(d) Black-Black * Ach.	-0.165 *	-0.150 *	-0.140 *	(b) vs (d)	0.07	0.01
	(0.06)	(0.07)	(0.06)	(c) vs (d)	0.62	0.40
					0.82	
<b>CHILD-TEACHER RACE X ACHIEVEMENT X SCHOOL PCT BLACK</b>						
(a) White-White * Ach * School	ref	ref	ref			
				Comparison		
(b) White-Black * Ach * School	-0.001	-0.052	0.042	(a) vs (b)	0.99	0.52
	(0.09)	(0.08)	(0.11)	(a) vs (c)	0.13	0.06
(c) Black-White * Ach * School	0.049	0.067 *	0.058	(a) vs (d)	0.08	0.16
	(0.03)	(0.04)	(0.04)	(b) vs (c)	0.58	0.17
(d) Black-Black * Ach * School	0.082 *	0.082	0.060	(b) vs (d)	0.39	0.18
	(0.05)	(0.06)	(0.05)	(c) vs (d)	0.53	0.82
					0.97	
<b>ALL COVARIATES</b>						
	Y	Y	Y			

(1). "All covariates" include all necessary one-way, two-way, and three-way interaction terms plus the covariates for demography, social comparison, disidentification, and teacher’s characteristics. For the display purpose, only the selected variables above are shown in the table (e.g., child-teacher race X school is not displayed but included in the model, etc). (2). "School" represents the school climate pertaining to academics, discipline, school spirit, and administrative cooperation. A high value indicates a favorable norms and culture of the school on these four domains. (3) All regression estimates are based on multiply imputed data.

Table 7.12 Distribution of Children by School Composition and Climate, 8<sup>th</sup> Grade

School Pct. Black

		"More White" <sup>1</sup>	"More Black" <sup>1</sup>	Total
School Pct.	"More Rich" <sup>2</sup>	3,317	1,448	4,765
Free Lunch	"More Poor" <sup>2</sup>	428	952	1,380
	Total	3,745	2,400	6,145

School Pct. Black

		"More White" <sup>1</sup>	"More Black" <sup>1</sup>	Total
School	"Hi Climate" <sup>1</sup>	2,730	496	3,226
Climate	"Lo Climate" <sup>2</sup>	2,035	884	2,919
	Total	4,765	1,380	6,145

School Climate

		"Hi Climate" <sup>1</sup>	"Lo Climate" <sup>1</sup>	Total
School Pct.	"More Rich" <sup>2</sup>	2,186	1,559	3,745
Free Lunch	"More Poor" <sup>2</sup>	1,040	1,360	2,400
	Total	3,226	2,919	6,145

Table 8.1. Multilevel Linear Growth Model Regression of Academic Self-Concept on Achievement, Panel Data across 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade (N=9497)

Fixed Effects		IRT		TEACHER		PARENT	
		Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
Initial status	Intercept	3.224	0.033 *	3.060	0.032 *	2.961	0.028 *
	Black	0.091	0.024 *	0.065	0.026 *	0.038	0.025
	Female	0.022	0.014	0.011	0.015	0.020	0.015
	Family SES	0.007	0.012	0.032	0.013 *	0.048	0.013 *
	Cognitive Score at K	0.000	0.001	0.005	0.001 *	0.008	0.001 *
Rate of change (Time)	Intercept	-0.411	0.027 *	-0.281	0.027 *	-0.339	0.025 *
	Black	0.007	0.019	0.019	0.019	-0.002	0.017
	Female	0.107	0.012 *	0.075	0.011 *	0.108	0.012 *
	Family SES	0.041	0.011 *	0.020	0.010	0.045	0.010 *
	Cognitive Score at K	0.003	0.001 *	0.000	0.001	0.001	0.001 *
Rate of change (Achieve)	Intercept	0.155	0.025 *	0.188	0.025 *	0.066	0.029 *
	Black	-0.040	0.019 *	-0.026	0.021	-0.023	0.018
	Female	-0.002	0.014 *	-0.012	0.013	0.004	0.015
	Family SES	0.007	0.011	0.014	0.010	-0.002	0.009
	Cognitive Score at K	0.002	0.001 *	-0.001	0.001	0.000	0.001
Rate of change (Time*Achieve)	Intercept	0.043	0.021 *	0.079	0.022 *	0.048	0.021 *
	Black	-0.012	0.015	-0.004	0.017	-0.015	0.015
	Female	0.012	0.012	0.005	0.011	-0.002	0.013
	Family SES	0.000	0.009	-0.006	0.008	-0.003	0.009
	Cognitive Score at K	-0.001	0.001 *	0.000	0.001	-0.001	0.000
Level 1 Controls	Retention Status	0.096	0.024 *	0.047	0.025	-0.004	0.026
	School % Black	0.048	0.009 *	0.028	0.009 *	0.037	0.010 *
	School % Free Lunch	0.020	0.008 *	0.004	0.009	0.009	0.009
	School Climate	0.010	0.005	0.008	0.005	0.017	0.006 *
Variance Components							
Level 1	Within-person	0.565	0.006 *	0.561	0.006 *	0.561	0.006 *
Level 2	Initial Status	0.379	0.011 *	0.397	0.011 *	0.424	0.010 *
	Rate of Change (Time)	0.258	0.012 *	0.238	0.014 *	0.258	0.012 *
	Covariance	0.379	0.011 *	0.397	0.011 *	0.424	0.010 *

(1) All regression estimates are based on the multiply imputed data ( $m=10$ ); (2) academic self-concept is not standardized and ranges from 1 to 4; (3) achievement is standardized at each wave, not across waves; (3) \* indicates  $p<0.05$ .

Table 8.2. Multilevel Linear Growth Model Regression of Academic Self-Concept on Between-Person and Within-Person Achievement, Panel Data across 3<sup>rd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade (N=9497)

Fixed Effects		Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
Initial status	Intercept	3.221	0.029 *	3.185	0.032 *	2.979	0.028 *
	Black	0.103	0.025 *	0.096	0.025 *	0.039	0.025
	Mean Achieve	0.322	0.011 *	0.263	0.013 *	0.111	0.012 *
	Black * Mean Achieve	-0.100	0.019 *	-0.045	0.024 +	-0.044	0.024
	Female	0.012	0.014	-0.024	0.015	0.013	0.015
	Family SES	-0.021	0.012	-0.001	0.013	0.041	0.013 *
	Cognitive Score at K	0.001	0.001	0.002	0.001 *	0.007	0.001 *
Rate of change (Time)	Intercept	-0.341	0.023 *	-0.261	0.025 *	-0.330	0.026 *
	Black	0.017	0.020	0.018	0.019	-0.003	0.017
	Mean Achieve	0.021	0.010 *	0.085	0.010 *	0.031	0.009 *
	Black * Mean Achieve	0.009	0.015	0.000	0.000 *	-0.004	0.018
	Female	0.110	0.012 *	0.081	0.011 *	0.107	0.012 *
	Family SES	0.043	0.010 *	0.024	0.010 *	0.045	0.011 *
	Cognitive Score at K	0.001	0.001 *	0.000	0.001	0.001	0.001
Rate of change (Deviation Ach)	Intercept	0.123	0.084	0.129	0.044 *	0.038	0.052
	Black	-0.031	0.058	-0.016	0.038	-0.005	0.034
	Mean Achieve	0.054	0.033	-0.007	0.021	0.011	0.016
	Black * Mean Achieve	-0.117	0.051 *	0.000	0.000 *	-0.049	0.034
	Female	0.001	0.037	-0.001	0.024	-0.011	0.024
	Family SES	-0.034	0.027	0.013	0.018	-0.010	0.017
	Cognitive Score at K	-0.001	0.002	-0.002	0.001	0.000	0.001
Rate of change (Time*Dev Ach)	Intercept	-0.056	0.060	0.036	0.038	0.006	0.043
	Black	-0.014	0.045	-0.006	0.029	-0.013	0.028
	Mean Achieve	-0.022	0.025	0.003	0.017	-0.008	0.013
	Black * Mean Achieve	0.000	0.055	0.019	0.036	0.033	0.028
	Female	-0.002	0.031	-0.004	0.021	0.016	0.023
	Family SES	0.010	0.020	-0.007	0.015	0.006	0.018
	Cognitive Score at K	0.002	0.001	0.001	0.001	0.000	0.001
Level 1 Controls	Retention Status	0.155	0.023 *	0.084	0.025 *	0.002	0.025
	School % Black	0.050	0.009 *	0.019	0.009 *	0.035	0.010 *
	School % Free Lunch	0.028	0.008 *	0.005	0.008	0.009	0.009
	School Climate	0.010	0.005	0.009	0.005	0.017	0.006 *
Variance Components							
Level 1	Within-person	0.560	0.006 *	0.556	0.006 *	0.560	0.006 *
Level 2	Initial Status	0.380	0.011 *	0.397	0.011 *	0.423	0.010 *
	Rate of Change (Time)	0.258	0.012 *	0.244	0.013 *	0.258	0.012 *
	Covariance	0.380	0.011 *	0.397	0.011 *	0.423	0.010 *

(1) All regression estimates are based on the multiply imputed data ( $m=10$ ); (2) academic self-concept is not standardized and ranges from 1 to 4; (3) achievement is standardized at each wave, not across waves; (3) "Mean Achieve" represents each student's mean achievement across the three waves; "Deviation Ach" represents the deviation of achievement at time  $t$  from the mean achievement; (4) \* indicates  $p < 0.05$ .

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## CURRICULUM VITAE

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### EDUCATION:

- 2009 - 2017. Ph.D., Sociology, Johns Hopkins University, Baltimore, MD.  
Dissertation: "Black-White Difference in Performance Discounting: Academic Self-Concept and Achievement and Student-Teacher Racial Mismatch in the Classroom in U.S. Elementary and Middle Schools."
- 2009 - 2013. M.A., Sociology, Johns Hopkins University, Baltimore, MD.
- 2010 - 2012. NICHD Multidisciplinary Population Trainee,  
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.
- 2007 - 2009. M.A. candidate, Sociology, Northern Illinois Univ., DeKalb, IL. (Left in good standing)
- 1995 - 1997. Ph.D. candidate, Economics, UCLA, Los Angeles, CA. (Left in good standing)
- 1991 - 1995. B.A., Economics, The University of Chicago, Chicago, IL.
- 1987 - 1991. Gilman School, Baltimore, MD. (Cum Laude)

### RESEARCH INTEREST:

Areas: Stratification and Inequalities, Social Disparities in Health, Sociology of Education, Child and Adolescent Development, Quantitative Methods

### PUBLICATIONS:

#### Peer-reviewed journal articles:

Hao, Lingxin and Han Soo Woo. 2012. "Distinct Trajectories in the Transition to Adulthood: Are Children of Immigrants Advantaged?" *Child Development* 83(5):1623-1639.

### ARTICLES IN PROGRESS:

Co-Author, "Profiles of Fetal Cardiac and Motor Development: Demographic Correlates and Relationship to Infant Developmental Status."

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### PRESENTATIONS AT PROFESSIONAL MEETINGS:

2013. Woo, John. "Combination Patterns of Residential Segregation: Latent Profile Analysis of Five Dimensions of Segregation." Presented for the regular session presentation at the Annual



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- 2014. Department Summer Research Grant, Sociology Department, Johns Hopkins.
- 2011. NICHD Multidisciplinary Population Trainee Grant, Johns Hopkins School of Public Health.
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