

Academic Race and Gender Stereotypes and Adolescents' Self-Perceptions

Olivenne D. Skinner

A thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Psychology. (Developmental).

Chapel Hill
2010

Approved by:

Beth Kurtz-Costes

Vonnie McLoyd

Lynne Vernon-Feagans

Keith Payne

ABSTRACT

Olivienne D. Skinner: Academic Race and Gender Stereotypes and Self-perceptions
(Under the direction of Beth Kurtz-Costes)

The relation between African American adolescents' academic self-concepts and their views about the abilities of their race and gender in-group and corresponding out-groups was examined in two academic domains: math/science and literacy. 296 seventh grade students reported their beliefs about the abilities of Blacks, Whites, girls and boys as well as their self-concept in these domains. Adolescents reported traditional academic race stereotypes, but reported that girls are better than boys in both math/science and literacy. Girls' math/science self-perceptions were related to their beliefs about the abilities of their racial out-group (i.e., Whites) and gender in-group (girls); literacy self-perceptions were related to their beliefs about the abilities of Blacks in that domain. Boys' math/science self-perceptions were related to their beliefs about the math/science abilities of Blacks and boys, but their literacy self-perceptions were unrelated to group competence perceptions. The implications for educational policy are discussed.

TABLE OF CONTENTS

List of Tables	iv
List of Figures	v
Academic Race and Gender Stereotypes and Adolescents' Self	
Perceptions.....	1
Method	12
Results	15
Discussion	19
References	26

LIST OF TABLES

Table

1. Regression Analyses Predicting Girls' and Boys' Academic Self-Concept.....31

LIST OF FIGURES

Figure

1. Means for gender group competence scores32
2. Means for gender group competence scores.....33
3. Gender differences in self-concept.....34

Race and gender are two social categories that are salient to children at an early age. Children are able to sort photos on the basis of sex by age three (Katz & Kofkin, 1997), and by age four their awareness of ethnicity and racial categories are developing rapidly (Aboud & Amato, 2001). It is not until middle childhood, however, that children develop a more sophisticated understanding of these social categories. During this time they move away from simple external descriptions of individuals to comparisons of traits and behaviors; thus race and gender take on more of an evaluative meaning (Ruble et al., 2004).

Like many other social categories, there are positive and negative stereotypes associated with race and gender groups. Prevalent academic stereotypes in the United States are that girls are naturally gifted in verbal domains, but lack ability in math, while boys are viewed as gifted in math and science, and thus scientific work is more suitable for them (Hill, Corbett & St. Rose 2010; Kiefer & Sekaquaptewa, 2007; Schmader, Johns, & Barquissau, 2004). Additionally, African Americans are stereotyped as unintelligent and less academically competent in comparison to Whites (Devine & Elliot, 1995; Steele, 1997; Steele & Aaronson, 1995), but as more talented in non-academic areas such as sports (Devine & Elliot, 1995, Sailes, 1991). The awareness of social stereotypes, status differences between groups, and discrimination is considered to be a part of social identity development (Ruble et al., 2004). Research conducted by Quintana (1998) suggests that children begin to recognize the broader implications of racial and ethnic differences (i.e., social status differences, stereotypes) between the ages of 10 and 14 years. Adolescence is also believed to be a time of “gender role intensification,” when boys and girls are pressured to adopt

more extreme gender differences in their interests, values, and activities (Hill & Lynch, 1983). In addition to aspects of cognitive development that might lead to this cognizance of distinctions among social groups, the changes in school context that most American adolescents undergo during early adolescence may also play a role in the increasing awareness of the meaning and significance of these social categories. Rowley and colleagues (2007) suggest that the focus on ability in middle schools, along with its increasing grouping of students by ability level, may make race and gender academic stereotypes more salient.

Substantial research documents the disparities in educational achievement and attainment of African Americans in comparison to their White counterparts (Gillborn, 2008; Jencks & Phillips, 1998). Gender disparities also exist in the educational attainment and occupational advancement of women compared to men in certain math and science fields such as computer science, engineering and physics (Hill et al., 2010). These race and gender disparities have been attributed to numerous factors including genetics, parental and teacher expectations, motivation, culture and history. Although stereotypes may arise in part from individuals' awareness of race and gender differences in achievement, ironically, research suggests that they are also a contributing factor to these differences when socioeconomic status, schools, and teacher quality are equivalent (Aronson & Steele, 2005). I take the view suggested by previous researchers (e.g., Evans, Copping, Rowley, & Kurtz-Costes, in press; Kurtz-Costes, Rowley, Harris-Britt, & Woods, 2008) that one of the mechanisms whereby stereotypes may influence achievement is through their influence on self perceptions.

The goal of this study is to investigate the relations between African American adolescents' views about the abilities of their race and gender in-groups and corresponding out-groups with their academic self-concepts in the domains of math/science and

reading/writing. Evans et al. (in press) recently found that both race and gender in-groups were important for African American boys' self-concepts in the academic domains of math/science and language arts. For African American girls, however, only views about their gender in-group were related to their self-concept in the domain of reading and writing. In the following sections, I discuss the importance of academic self-concept as a predictor of academic achievement, prior developmental research on race and gender academic stereotypes, relations between stereotypes and self-views, and the intersection of race and gender as social identities among African American youth.

Academic Self Concept

Self-concept is made up of beliefs about different aspects of the self and evaluations of one's performance in different areas (Wigfield & Wagner, 2005). It has many components and subcomponents, including appraisals of one's competences and characteristics, evaluations regarding the relative importance or value of the various competencies and characteristics, and a general sense of one's self-worth or self-esteem. Academic self-concept is how one views one's academic ability compared to that of other students (Cokley, 2002). It is shaped by both internal and external comparisons (Marsh, 1990). In this paper I examine the relation between adolescents' endorsement of race and gender stereotypes, and adolescents' academic self-concept in two academic domains: English and math/science.

The causal ordering of academic self-concept and academic achievement has been of great interest to researchers (Marsh, Trautwein, Ludtke, Koller & Baumert, 2005). Two models of academic self-concept have been explored. According to the self-enhancement model, academic self-concept is a primary determinant of academic achievement. In contrast, the skill development model conceptualized academic self-concept as a consequence of

academic achievement. The integration of these two models resulted in the reciprocal effects model, which postulates that prior academic self-concept affects later academic achievement and past achievement affects later self-concept; thus both are mutually reinforcing (Kurtz-Costes & Schneider, 1994; Marsh et. al, 2005).

It is important to understand factors that can influence academic self-concept because of the relationship between self-concept and achievement. The perceptions students have of their ability can influence their achievement behavior. For example, it has been found that for both mathematics and English, students' plans for future course enrollment are related not only to their task values but also to their self-concept of ability (Eccles, 1984). Increasing self-concept can result in decreased test anxiety, decreased risk of dropping out of school, enrollment in advanced courses, and higher levels of long-term educational attainment (Burkley & Blanton, 2008). Okeke and colleagues (2009) suggest that adolescents' perceptions of their competence and the perception of the competence of their social groups might be factors that shape, directly and indirectly, their confidence in their abilities to handle honors and advanced placement classes, enabling them to be competitive applicants for college.

Academic Race and Gender Stereotypes

Stereotypes are generalized beliefs about members of a social group such that characteristics are "attributed to all members of a given group without regard to variations that must exist among members of the group" (Babad, Birnbaum & Benne, 1983, p. 76). These generalizations exist about all groups of people and can be emotionally positive (e.g., African Americans are athletic), negative (e.g., girls do poorly in math) or neutral (e.g., boys like to play sports). Social psychologists believe that stereotypes are universal and that they

help individuals process information about their social environment. Often, however, stereotypes misrepresent the characteristics of group members by overemphasizing similarity among them (Babad et al., 1983). Moreover, stereotypes are misleading when individual members do not have the characteristic that is ascribed to the group as a whole (e.g., not all boys do well in mathematics and science). Stereotypes about different social groups are usually well known by others (Eccleston & Major, 2008), including the people who are the subject of the stereotypes (Crocker & Major, 1989). People are often selective in the stereotypic information they adopt, choosing beliefs that appear most useful to them in terms of their accuracy and consistency. The stereotypes that individuals endorse also depend on their group membership and the nature of their social identities (Babad et al., 1983). Social identity theory (discussed later) would suggest that some of this selectivity reflects the individual's attempt to maintain a positive social identity.

Eccleston and Major (2008) argue that because academic performance is valued so highly in our society, the potential threats to self caused by being negatively stereotyped in the academic domain are extremely high. Race and gender academic stereotypes, however, are still prevalent and widely endorsed in our society. People tend to view mathematics and the physical sciences as masculine domains, while English and other verbal skill areas are viewed as feminine academic domains (Bornholt, Goodnow & Cooney, 1994; Eccles, Barber, Jozenfowicz, Malenchuk & Vida, 1999). Stereotypes about gender differences in mathematics and science are quite pervasive. For example, in 2005, during his tenure as president of Harvard University, Lawrence Summers caused widespread outrage because of his address at an academic conference in which he stated that “innate differences between men and women might be one of the reasons fewer women succeed in science and math

careers” (Bombardieri, 2005). Contrary to his comments, however, no gender differences have been found in children’s general mathematic abilities; in fact, the male advantage in this subject only begins in high school (Leahey & Guo, 2001). Moreover, recent research has shown that high school girls are earning credits in math and science at the same rate as boys and are even doing better than boys in these subjects (Shettle et al., 2007). Blanton, Christie and Dye (2001) suggest that gender stereotypes such as these are more widely endorsed in our society in comparison to other stereotypes about social groups (e.g., racial stereotypes) because they reinforce the idea of men and women having complementary characteristics.

In the United States, African Americans are viewed as intellectually inferior to Whites (Bobo, 2001; Steele, 1997). Moreover, African Americans boys are more likely than their female counterparts to be negatively stereotyped about their academic abilities (Hudley & Graham, 2001). This stereotype has a long history and was used to justify slavery. Unfortunately, today some people still believe, perpetuate, and act on these stereotypes. Negative stereotypes about the academic abilities of African Americans are reinforced by widespread media attention highlighting their lower standardized test scores and GPAs in comparison to their White and Asian peers (Kellow & Jones, 2008) and representing them in other stereotypic ways (Devine & Elliot, 1995). Although these stereotypes may be recognized and dismissed by their targets as stereotypes and therefore not applicable to all members of their social group, at times they are endorsed by the targets themselves as well as out-group members.

Adolescents’ Endorsement and Awareness of Stereotypes

Indirect evidence of adolescents’ awareness of academic race and gender stereotypes is evident in the stereotype threat literature. For example, Kellow and Jones (2008) showed

that African American 9th grade students were aware of the negative stereotypes about the academic abilities of African Americans. When stereotype threat was induced, the students' performance on a mathematical reasoning task was impaired, and their expectations for success declined. Indirect endorsement of academic gender stereotypes is also evident from research showing that adolescents' self-perceptions often fall in line with traditional gender stereotypes with boys reporting higher self-concepts in math in comparison to girls--even with girls' better grades in this area--and girls reporting higher self-concepts in English than in math or science (Frome & Eccles, 1998; Kurtz-Costes, et al., 2008; Tiedemann, 2000).

Few studies have examined adolescents' direct endorsement of race and gender stereotypes. In one study conducted with African American and White adolescents, middle school youth of both racial groups reported that they believed Whites were better than African Americans in academics. African American adolescents, however, reported smaller differences between the groups in comparison to the ratings of their White peers (Rowley et al., 2007). Additionally, Hudley and Graham (2001) reported that the adolescents in their sample selected White males as high achievers, but selected few African Americans and Latino adolescents as high achievers. Rowley and colleagues (2007) found that girls and African Americans were more likely to report positive stereotypes about their social groups than negative stereotypes. For example, girls endorsed the stereotype that girls were better than boys in reading/writing, but they did not report a male advantage in math and science. However, Plant and colleagues (2008) found that some middle school girls, even when exposed to an intervention designed to change their attitudes towards science and engineering fields, still endorsed the stereotype that math and science are masculine subjects and that boys perform better in them. Thus, although results differ for gender as compared to race

stereotypes, the limited research on the topic indicates that by early adolescence, youth are aware of and may endorse traditional academic stereotypes.

Stereotypes and Academic Self Perceptions

Social identity theory offers some insights concerning individuals' endorsement of stereotypes. Social identity consists of the aspects of one's self image that comes from the social categories to which an individual claims membership (Tajfel and Turner, 1979). According to this theory, individuals strive to maintain a positive social identity. This goal is achieved and maintained when the in-group is compared to the out-group on valued dimensions and the in-group is viewed positively. This theory suggests that there is "pressure" to evaluate one's in-group positively; therefore, individuals should be unlikely to endorse negative stereotypes about the groups to which they belong. More recent research and theory suggest, however, that the tendency for individuals to endorse stereotypes may also depend on their relative status in society.

Research based on intergroup theories of stereotypes and prejudice using minimal group manipulations in which social groups are based on meaningless or random criteria (e.g., t-shirt color) supports the claims of social identity theory. In such studies children and adults often develop biases towards their own group (Bigler, Brown & Markell, 2001). Bigler et al. (2001) theorized that these results may be influenced by the relative status of individuals in American society such as males versus females, and Whites versus Blacks. Bigler and her colleagues (2001) created groups of high status and low status children identified by the color of their shirts. They found that when teachers made functional use of these groups through seating arrangements, verbal categorizations, and task assignments, the high status children developed an in-group bias, but children from the low status group were

egalitarian in their ratings. Rowley et al. (2007) found similar status effects using real life categories of race and gender; they suggested that the tendency of low status groups to be relatively egalitarian in evaluations where common stereotypes portray their social group negatively may reflect an effort to protect self-esteem. If individuals' tendencies to endorse stereotypes varies according to group status as well as other factors, it is important to consider whether individual self-concept is related to beliefs about both in-group and out-group members. The question of whether beliefs about ones in-group or related out-groups are more influential in shaping self-views is also quite relevant.

Researchers have long theorized that comparisons with others may impact self-appraisals and self-esteem (Festinger, 1954). Research has supported these ideas, demonstrating that self-views are strongly related not only to individuals' beliefs about their abilities, but also their beliefs about how others around them compare to themselves. Festinger (1954) further proposed that one exhibits a level of selectivity in who is chosen in this comparison process, such that those who are members of one's in-group are more likely to be a basis of comparison rather than out-group members. This selectivity is believed to play an integral role in explaining the paradoxical high self esteem and life satisfaction found among those who are stigmatized or marginalized in society such as African Americans, thus it is believed to be self-protective (Major, Sciacchitano & Crocker, 1993). Sanders and colleagues (1979) tested this hypothesis and found evidence for selectivity in the use of comparison information such that only the scores of similar others affected how the study participants viewed their abilities. In their discussion, Sanders and colleagues (1979) suggested that individuals' estimates of their abilities may be a "compromise" between their

standing relative to those who are similar to themselves and to all others who are available for comparison.

Major, Sciacchitano and Crocker (1993) directly tested the effect that in-group versus out-group comparisons have on the self. They found that in contexts where the out-group fares more positively than the in-group, views about the in-group have a greater impact on self-esteem than views about the out-group. In contexts where the in-group fares positively, however, these researchers found that views about the in-group and the out-group both influence self-esteem. Somewhat contradictory to Major et al. (2003), Kurtz-Costes and her colleagues (2008) found that middle school girls' beliefs about the abilities of boys and girls in math were unrelated to their self-perceptions in mathematics. However, boys' beliefs about the in-group (i.e., boys in general) and out-group (i.e., girls) were related to their math self-concepts. These findings suggest that individuals may protect their self-concepts by disengaging their self-views from the negative stereotypes associated with the social groups of which they are members (Evans et al., in press).

Using a college age sample of Caucasian youth, Kiefer and Shih (2006) showed that negative stereotypes can lead individuals to view poor performance as diagnostic of their ability. Stereotypes reduced the self-serving bias and led individuals to be less confident in their abilities in the domains in which they were negatively stereotyped. Taken together, this body of research shows that whereas stereotype endorsement is sometimes related to self-views, that connection is not always found, and differs by age, academic domain, social status, and other group factors. One such factor is multiple identity—the fact that each person is a member of multiple social groups.

Multiple Identities

Individuals occupy multiple social categories in tandem (e.g., race, gender, religion, age group, social class, sexual orientation), and these categories can be associated with both positive and negative stereotypes. For example, in the case of Black girls, as females they benefit from the positive stereotypes about girls' superior literacy skills, but they also must contend with the stereotypes depicting their racial group as having low intellectual ability and academic competence. Little psychological research, however, has focused on how individuals synthesize information about the multiple social categories to which they belong (Cole, 2009).

The intersectionality framework was developed by feminist and critical race theorists to describe analytic approaches that consider the meaning and consequences of one's membership in multiple group categories. Although psychologists have been slow to incorporate intersectionality into their work, the importance of examining the role of multiple categories of group membership has been increasingly acknowledged (Cole, 2009). In contrast to additive models suggesting that, for example, with each minority status an individual occupies there is an accumulation of disadvantage, the intersectionality framework emphasizes the qualitative differences among different intersectional positions (Shields, 2008). In this paper I consider how the social categories of race and gender shape the identity beliefs of Black youth.

Study Aims

The goal of the current study was to examine the relationship between youths' beliefs about the academic competence of their race and gender in- and out-groups and their beliefs about their own academic abilities. Based on previous research, I expected beliefs about in-groups to be more strongly related to youths' academic self-concept than corresponding

beliefs about out-groups in domains where youths are negatively stereotyped. For example, I hypothesized that boys' ratings of boys' academic competence in the literacy domain would be more strongly related to self-concept than boys' ratings of girls or boys' ratings of boys in math/science. In domains in which the in-group is positively stereotyped, I expected that both ratings of the in-group and the out-group would be related to self-concept. These research questions are complicated, however, because the adolescents in this sample belong to groups that are associated with both positive and negative stereotypes in each of the academic domains explored. Thus, I explored whether self-concept was more closely associated with views about one's gender group or views about one's racial group.

Method

Participants

Data for the current report come from a longitudinal study focused on achievement motivation in Black youth. Students ($N = 296$, 169 girls, 129 boys, M age = 13.01) were originally recruited when they were in the fifth grade as part of a larger sample of 463 students of various racial and ethnic groups. Data for this paper came from the seventh grade assessment. Students in the current study attended 17 different middle schools in an urban school district in the southeastern region of the United States. The percentage of African American students in these schools ranged from 27% to 98%, with 19.3 % of the students attending schools where the African American student population was less than 50%, 36.5% in schools with an African American population between 52% and 70%, and 44.2% of the students attended schools where the African American population was greater than 70%. Family income data were available for 241 of the participants. Participants reported a broad range of income; 17.4% of the families reported incomes less than \$10,000, 34.4% reported

incomes between \$10,000 and \$29,999, 22% reported incomes between \$30,000 and \$49,999, 13.7% reported incomes between \$50,000 and \$69,999 and 12.4% reported incomes greater than \$70,000.

Procedure

During initial recruitment, consent forms and a letter detailing the project were distributed to students in their classrooms. Of the families who responded, 97% agreed to participate. A total of 384 students who identified themselves as Black completed questionnaires at that initial time point (Wave 1) when youth were in Grade 5. Some of these students are not included in the present sample because they could not be located at Wave 2 ($n = 57$), refused participation ($n = 17$), no longer identified themselves as Black ($n = 5$), or did not participate for other reasons (e.g., repeated absences on testing dates; $n = 8$).

Students completed a battery of questions including the measures used for this study in small groups at school. Graduate students were present to monitor the participants and to answer questions. All students received a small incentive for their participation.

Measures

Perceptions of Group Competence. Students completed visual analogue scales (VAS) to record their perceptions of the competence of boys, girls, White children, and Black children in several academic (e.g., math, science) and non-academic (e.g., making friends, sports) areas. These VAS scales use 100 mm lines with descriptors at each end (e.g., “not well at all;” “very well”), and students indicated on each line their ratings of a specific social group in the different areas. Group competence ratings reported in this paper represent how far in millimeters along the line a child marked each group for each question. Scores ranged from 0 to 100, with higher scores representing higher competency ratings. Social

groups were represented on separate pages (e.g., one page had all items about boys). Two forms were used to control for sequence of measures. Survey packets were arranged such that the two members of each social category were never adjacent to each other (i.e. “boys” were never adjacent to “girls”). For the present study, we used the adolescents’ ratings of the 4 groups in 4 academic domains: math, science, reading and writing.

To obtain math/science competence scores for each race and gender group, we averaged students’ response to three questions: how well the group does in each subject and how members of the group “find” math (i.e., “very hard” to “very easy”). Two items were averaged to compute literacy competence: students’ ratings of how well members of each group perform in reading and how well group members perform in writing.

Academic Self Concept. Students rated their self-concept in various academic and non-academic areas. Self-concept was assessed with histograms with a column of 25 figures in each item (Nicholls, 1978). The top of the histogram was labeled “the best” (e.g., in math) and the bottom was labeled, “the worst” (e.g., in math). Students circled how they viewed themselves in comparison to their classmates with possible ratings from 1 (the worst) to 25 (the best). Students’ self-concept ratings in math and science were averaged to create a math/science self-concept score; the same was done for reading and writing to create a literacy self-concept score.

Grades. Students’ end-of-the-year course grades in math, science, and language arts were obtained from school records. These scores were used as control variables in the regression analyses. Grades for math and science were averaged to create a math/science grade.

Income. Parents/guardians reported household income by selecting one of 11 responses (range = less than \$10,000 to greater than \$100,000). Income was used as a control variable in the regression analyses.

Results

Repeated measures analyses of variance (ANOVA) were used to compare participants' ratings of the competence of each race and gender group and to assess gender differences in domain-specific self-concept. Next, ordinary least squares regression was used to examine the extent to which students' endorsement of traditional race and gender stereotypes about literacy and math/science abilities were related to their academic self-concepts in those domains. An alpha level of .05 was used throughout.

A 2(Gender) x 2(Gender Group Competence) x 2(Academic Domain) repeated measures ANOVA was conducted to examine group differences in students' reports of gender-group competence. Gender (boy, girl) was entered as a between subjects factor and Gender Group Competence (ratings of boys' competence; ratings of girls' competence) and Academic Domain (math/science, literacy) were entered as within subject factors. Similarly, a 2(Gender) x 2(Race Competence) x 2(Academic Domain) repeated measures ANOVA was conducted for the analyses on racial-group competence. Race Competence (competence of Whites; competence of Blacks) and academic domain were entered as within subjects factors, and gender was entered as a between subjects factor. Figures 1 and 2 show the means of participants' gender and race group competence ratings. The results obtained in these analyses were similar to results obtained when a multiple imputation technique was used to account for missing data.

Group Differences in Group Competence Ratings and Self-Concept

Gender Group Comparisons. For the repeated measures ANOVA on ratings of boys' and girls' competence, the main effect of Gender Group Competence was significant as was the Gender x Gender Group Competence interaction, and the Gender Group Competence x Academic Domain interaction, $F(1, 295) = 129.10, 39.44, 27.24$ respectively. The main effect of Gender revealed that girls ($M = 71.0$) were viewed as more competent than boys ($M = 58.3$) across domains, $d = .80$. This main effect was qualified by the Gender x Gender Group Competence interaction, which revealed that boys viewed boys ($M = 64.8$) as more competent than girls viewed them ($M = 51.7$), $d = .75$. Girls' ratings of their own competence were not significantly different from boys' ratings of girls' competence. The Gender Group Competence x Academic Domain interaction revealed, as expected, that boys were rated by both boys and girls as more competent in math/science ($M = 60.0$), than in literacy ($M = 56.5$), $d = .18$ and girls were rated as more competent in literacy ($M = 72.2$), than in math/science ($M = 69.7$), $d = .15$. The main effect of Academic Domain, the Gender x Academic Domain interaction, and the Gender x Academic Domain x Gender Group interaction were not significant.

Race Group Comparisons. The repeated measures ANOVA on Race Group Competence scores revealed significant main effects for Race Group Competence and Academic Domain $F(1, 292) = 58.14, 6.55$, respectively. These effects were qualified by a significant Gender x Race Group Competence x Academic Domain interaction $F(1, 292) = 10.32$. The interaction revealed that boys rated Blacks as more competent in math/science ($M = 69.6$) than girls rated Blacks in math/science ($M = 64.0$), $d = .32$. Youths did not differ in their ratings of Blacks in literacy or their ratings of Whites in either academic domain (see Figure 2). The main effects of Race Group Competence and Academic Domain showed that

overall, Whites ($M = 75.7$), were rated as more competent than Blacks ($M = 66.3$), $d = .58$ and students rated both racial groups as more competent in math/science ($M = 71.6$), than in the literacy domain ($M = 70.4$), $d = .08$

Self-Concept. The repeated measures ANOVA on self-concept scores revealed a main effect of Academic Domain which was qualified by a Gender x Academic Domain interaction $F(1, 292) = 8.32, 5.86$ respectively. These results appear in Figure 3. The Gender x Academic Domain interaction revealed that girls reported higher self-concepts in the literacy domain ($M = 17.3$) in comparison to math/science ($M = 15.5$), $d = .36$, whereas boys' self-concept ratings did not differ across domains. Additionally, boys had higher self-concepts in math/science ($M = 16.4$) than girls ($M = 15.5$), $d = .18$, but the adolescents did not differ significantly in their literacy self-concepts. The main effect of Academic Domain reflected that youths had higher self-concepts in literacy ($M = 17.0$) than in math/science ($M = 16.0$), $d = .14$

Summary. Girls were rated as more competent than boys in all academic domains; however, boys rated boys as a group as more competent than they were rated by girls. Students' ratings of the competence of each race and gender group supported traditional stereotypes: Whites were viewed as more competent than Blacks, and boys were rated as more competent in math/science while girls were rated as more competent in literacy. Girls reported higher self-concept in literacy than in math/science, while boys' self-concepts did not vary by domain. Boys reported higher self-concepts in math/science in comparison to girls, but there were no significant differences in literacy self-concepts for boys and girls.

Relations between Group Competence Perceptions and Academic Self-Concept

Hierarchical multiple regression analysis was used to determine whether adolescents' beliefs about the competence of their race or gender in-group or out-group were more strongly related to their self-concepts. Four separate regression analyses were carried out, examining self-concept in each domain (math/science, reading/writing) separately for boys and girls. In all equations, in-group and out-group race and gender competence ratings and control variables of family income and students' grades were entered simultaneously. Results of these analyses are displayed in Table 1.

Girls' Self-concept. For the analysis on girls' reading/writing self-concept, the overall model was significant, $F(6, 107) = 3.45$, $R\text{-square} = .16$. Girls' ratings of the competence of Blacks explained the most variance. The better girls viewed their own race in the literacy domain, the better they rated their own literacy ability, $\beta = .36$. Grades in language arts were also positively related to their self-concepts. Unexpectedly, girls' beliefs about the competence of girls were unrelated to their literacy self-concepts.

In the math/science domain, the equation was significant, $F(6, 104) = 7.79$, $R\text{-square} = .31$. Girls' belief about the competence of their own race was not significantly related to their math/science self-concept. However, beliefs about the competence of girls, $\beta = .22$, Whites, $\beta = -.22$, and their math/science grades, $\beta = .44$, explained a significant amount of variance in math/science self-concept. The more competent girls viewed Whites in math/science, the less competent they viewed themselves.

Boys' Self-concept. The analysis on boys' literacy self-concepts was not significant, $F(6, 74) = 1.58$. The analysis on math/science scores was significant, $F(6, 74) = 4.71$, $R\text{-square} = .23$. Boys' ratings of the math/science competence of both their race and gender in-group was significantly related to their math/science self-concept, $\beta = .29$, and $.26$

respectively. The more capable these boys viewed Blacks and other boys in math/science, the better they perceived their own abilities in this domain. Math/science grade was also related to self-concept and explained the most variance in boys' self-concept, $\beta = .33$.

Summary. Multiple regression analyses revealed that in the literacy domain, only girls' beliefs about the competence of Blacks were related to their self-concepts. For math/science, however, beliefs about their own gender in-group were positively related to their self-concepts and beliefs about Whites were negatively related to their self-concept. For boys, neither beliefs about the competence of their in-group nor out-group were related to their literacy self-concept. In math/science, however, beliefs about the competence of Blacks and boys were positively related to their self concepts.

Discussion

In schools across the United States, disparities between Blacks students and their White peers are frequently apparent. In racially diverse school settings, Black students are often over-represented in non-college track and special education programs while their White peers are tracked in honors and Advanced Placement courses and programs (Conchas, 2006). In American society it is also widely apparent that women are under-represented in math and science related fields. These visible disparities reinforce and perpetuate the stereotypes prevalent in society about differences in abilities between race and gender groups. While much research has focused on the impact of stereotypes on performance through the mechanism of stereotype threat, little research has examined other ways in which stereotypes might affect the achievement of their targets (Kiefer & Shih, 2006). This study adds to the literature by examining the impact of race and gender stereotypes on adolescents' self perceptions in the academic domains of math/science and literacy.

The aim of this study was to investigate how Black youths' beliefs about the abilities of their race and gender in-groups and corresponding out-groups are related to their beliefs about themselves. We also examined whether beliefs about the abilities of in-groups and related out-groups are more relevant for the self-views of these adolescents and whether race or gender is more central to the adolescents' self-concepts. Because we controlled for academic achievement in the analyses, the results show that adolescents' perceptions of the abilities of the social groups to which they belong are related to their views of themselves above and beyond their actual domain-specific ability.

Stereotype Endorsement

Our finding that girls were rated as more competent than boys in all academic domains corresponds to previous research with African American adolescents (e.g., Evans et al., in press; Hudley & Graham, 2001; Rowley et al., 2007). This finding is not surprising given the poor academic performance of Black boys relative to their female counterparts (Rowley, Kurtz-Costes, & Cooper, 2010). It is interesting to note, however, that although both boys and girls believed that girls were more competent than boys, boys rated boys significantly more competent than girls rated them in both academic domains. This result may reflect both gender groups' efforts to maintain a positive self-esteem as suggested by social identity theory (Tajfel & Turner, 1979). However, the results also support Rowley et al.'s (2007) views that although individuals may engage in some form of self-enhancement, they may not engage in self-enhancement to the extent that they will view their in-group as superior to the out-group.

Students' beliefs reflected the traditional stereotype of males' greater competence in math/science in comparison to literacy, and females' greater competence in literacy in

comparison to math/science (Bornholt et al., 1994). Interestingly, although girls as a group were rated as more competent than boys in all domains, when reporting their beliefs about themselves individually, girls reported self-concepts that were similar to the self-concepts reported by boys. Adolescents' beliefs about the competence of Whites and Blacks also reflected the dominant view in society of Whites' greater intelligence in comparison to Blacks. These results are in contrast to previous research by Rowley and colleagues (2007) that reported that Black middle school aged students reported no differences in academic abilities between race groups, but is consistent with the findings of Evans et al (in press).

Group Competence Ratings and Self-Concept

Results concerning group competence ratings and self-concept indicate that the effects of stereotypes on self-views may operate differently for boys and girls. The results concerning boys' literacy self-concept are consistent with previous research that found that for a domain in which one's group is negatively stereotyped, stereotype endorsement is less likely to be related to self-concept than in domains where one's group is positively stereotyped (Kurtz-Costes et al., 2008). As suggested by Evans et al. (in press), such results may be a reflection of the individual's attempt to protect self-concept. Thus, boys in this study may be protecting their self-concepts by disengaging their self views from the negative stereotypes associated with Blacks and with boys in the literacy domain. The fact that boys' self-concept in math/science, a domain in which they believed they had greater competence in comparison to literacy, was similar to their literacy self-concept supports these views. The boys in this sample appear to benefit from the stereotype of boys' natural ability in math/science. The greater they viewed the abilities of boys, the greater their self-concept in the math/science domain regardless of their actual math/science achievement levels. It is

also interesting that boys' beliefs about the abilities of Blacks, even more so than their beliefs about the abilities of boys, were related to their self-perceptions given that they viewed Blacks as more competent in math/science in comparison to girls' views about Blacks.

The relationship between girls' beliefs about the abilities of their racial and gender in-groups and out-groups and their self-concepts revealed patterns that were less straightforward and different from the results obtained with boys. In literacy, girls' self-concepts were related only to their racial in-group, while in math/science their self-concepts were related to their gender in-group and racial out-group. These results are in contrast to previous findings by Evans and colleagues (in press). It appears that these girls did not draw from the positive stereotypes associated with their in-groups to enhance their self-concept in the literacy domain. These results suggest that negative stereotypes about the social groups that girls belong to may have a greater impact on their self-concept than positive stereotypes. Further research is needed to understand these gender differences.

These results are consistent with Kiefer and Shih's (2006) findings that negative stereotypes are more consequential for self-concept than positive stereotypes. In their study they found that women were more sensitive to negative feedback on a math test than a test described as a verbal test, while men were more sensitive to feedback on the same test when it was described as a test of their verbal ability rather than a test of their math ability. Additionally, the women were more likely to attribute their failure on the math test to lack of ability, while men were more likely to attribute their failure on the verbal test to lack of ability. These effects, however, were not found for either men or women when they received negative feedback in domains where their gender is viewed positively.

The present results partially support previous research that beliefs about similar others are more important for self-views than are beliefs about out-groups. Beliefs about the abilities of Whites were only associated with girls' self-concepts in the math/science domain. In contrast, math/science self-concept was related to in-group gender perceptions for both boys and girls, and to the racial in-group among boys. These results indicate that the influence of in-groups and out-groups on the self may not be a simple main effect (Major et al, 1993), but may depend on a variety of factors such as the valence of the stereotypes in society and perhaps participants' own characteristics such as gender.

Our results are inconsistent with the results of Evans et al. (in press). In their sample of 7th and 8th grade students from urban and rural school districts, girls' ratings of the academic competence of their racial in-group were unrelated to their self-concepts, and perceptions of their gender in-group were only related to their self-concept in the literacy domain. Those researchers also found that views about race and gender in-groups were important to boys' self-concepts in both academic domains. The students who participated in the study conducted by Evans and her colleagues were almost a year older than the students represented in this study. The inconsistencies in our findings may reflect the age differences of the two samples or contextual factors such as characteristics of the students' schools. The sample used by Evans et al. came from schools with majority Black students. In the current study, only 42.3 % of the students attended schools that were predominantly African American. This difference might also explain the finding that girls' beliefs about the abilities of Whites were negatively related to their self-concepts in math/science, whereas in the Evans et al. (in press) study, views of the youths' racial out-group were never related to self-concept. Further research exploring contextual factors is warranted to address these issues.

Implications for Educational Policy

Adolescents in this sample endorsed the stereotype of Whites' greater competence in academics in comparison to Blacks. Given the findings that these adolescents' self-views are related to their beliefs about their race in-group, it is important for them to reject the negative stereotypes that are prevalent in society about the intellectual capabilities of Blacks.

Although these stereotypes are deeply entrenched in society and not easily ignored, several steps can be taken so that these stereotypes do not become a part of adolescents' personal beliefs. Teachers and parents can play a role in helping to shape students' personal beliefs about the abilities of Blacks by highlighting the accomplishments of African Americans who have excelled academically to contrast with the images of Blacks being portrayed in the media as excelling primarily in music and athletics. It is also important for these students to have African American academic role models and mentors. The segregation of Black and other minority students in low-track classes most likely contributes to the endorsement of these stereotypes, thus it is important for schools to consider the implications of ability group tracking.

Although these adolescents did not believe that boys are better than girls in math/science, it is apparent that they were still influenced by the dominant views in society of boys' greater competence in this domain (girls were rated as better in literacy, boys believed that they were better in math/science). These results support previous research (e.g., Reid & Roberts, 2006) that highlights the importance of interventions to help increase the interest and achievement of African American girls in the fields of math/science.

Directions for Future Research

Although prior research has clearly shown that stereotypes can influence self-perceptions, it is also important to note that this relationship may be bidirectional such that the individual's self-perceptions also influence perceptions of the person's race and gender groups. This is the basic idea of social projection, defined as the tendency to expect similarities between oneself and others. Robbins and Krueger's (2005) meta-analysis revealed that social projection is stronger when judgments are made about the in-group in comparison to out-groups. Also supporting the idea that individuals' self-views can influence their views about the social groups that they belong to, Andreopoulou and Houston (2002) found that high status individuals, identified based on their performance on a test of verbal and spatial ability, had higher collective self-esteem than low-status participants.

Research using longitudinal designs is needed to further examine the relation between adolescents' academic self-concepts and their beliefs about the social groups to which they claim membership. Additionally, researchers should explore the contextual factors that are likely to mediate or moderate these relationships such as school racial composition. Although the results of this project show gender group differences in adolescents' perceptions, it should be noted that patterns of relations for individuals did not necessarily mirror the results for their gender group. Thus, additional research should also address individual differences in the relations between stereotypes and academic self-perceptions. This paper supports previous research about the powerful influence of stereotypes. While stereotypes are beneficial in some situations, their negative consequence to individuals, particularly those who are stigmatized in society, are undeniable.

References

- About, F.E., & Amato, M. (2001). Developmental and socialization influences on intergroup bias. In R. Brown & S. Gaertner (Eds.), *Blackwell handbook in social psychology: intergroup processes* (pp. 65-81), Vol 4. Oxford: Blackwell.
- Andreopoulou, A., & Huston, D. M. (2002). The impact of collective self-esteem on the intergroup evaluation: self-protection and self enhancement. *Current Research in Social Psychology*, 7(14), 243-257.
- Aronson, J., & Steele, C. M. (2005). Stereotypes and the fragility of academic competence, motivation, and self-concept In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 436-456). New York: The Guilford Press.
- Badad, E. Y., Birnbaum, M., & Benne, K. D. (1983). *The social self group influences on personal identity*. Beverly Hills: Sage Publications.
- Bigler, R.S., Brown, C. S., & Markell, M. (2001). *When groups are not created equal: effects of group status on the formation of intergroup attitudes in children*. *Child Development*, 72(4) 1151-1162.
- Blanton, H., Christie, C., & Dye, M. (2002). Social identity versus reference frame comparisons: the moderating role of stereotype endorsement. *Journal of Experimental Social Psychology*, 38, 253-267.
- Bobo, L. D. (2001). Racial attitudes and relations at the close of the twentieth century. In N. J. Smelser, W. J. Wilson & F. Mitchell (Eds.), *America becoming racial trends and their consequences* (Vol. 1, pp. 254-301). Washington DC: National academy press.
- Bombardieri, M. (2005, January 17). Summers' remarks on women draw fire. *The Boston Globe*. Retrieved from <http://www.boston.com>
- Bornholt, L. J., Goodnow, J. J., & Cooney, G. H. (1994). Influences of gender stereotypes on adolescents' perceptions of their own achievement. *American Educational Research Journal* 3, 675-692.
- Burkley, H., & Blanton, H. (2008). Endorsing a negative in-group stereotype as a self-protective strategy: Sacrificing the group to save the self. *Journal of Experimental Social Psychology*, 44(1), 37-49.
- Cokley, K. (2002). An investigation of academic self-concept and its relationship to academic achievement in African American college students. *Journal of Black Psychology*, 26(2), 148-164.
- Cole, E. (2009). Intersectionality and research in psychology. *American Psychologist*, 64(3), 170-180.

- Conchas, G. Q. (2006). *The color of success race and high achieving urban youth*. New York: Teacher's College Press.
- Crocker, J., & Major, B. (1989). Social Stigma and Self-Esteem: The Self-Protective Properties of Stigma. *Psychological Review*, 96(4), 608-630.
- Devine, P & Elliot, A. J. (1995). Are racial stereotypes really fading? The Princeton trilogy Revisited. *Personality and Social Psychology Bulletin*, 21(11), 1139-1150.
- Eccles, J. S., Barber, B., & Jozefowicz D. (1998a). Linking gender to educational, occupational, and recreational choices; applying the Eccles et al. model of achievement-related choices. In W.B. Swann, J.H. Langlois & L.A. Gilbert (Eds.), *Sexism and stereotypes in modern society: the gender science of Janet Taylor Spence* (pp. 153-192), Washington DC: American Psychological Association.
- Eccleston, C. P., & Major, B. (2008). Responding to self threats understanding stigma in the academic domain. In C. Hudley & A. E. Gottfried (Eds.), *Academic motivation and the culture of school in childhood and adolescence*. New York: Oxford University Press.
- Evans, A. B., Copping, K. E., Rowley, S. J., & Kurtz-Costes, B. (In press). Self-concept in Black adolescents: do race and gender stereotypes matter? *Self and Identity*.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117-140.
- Frome, P. M., & Eccles, J. S. (1998). Parents' influence on children's achievement-related perceptions. *Journal of Personality and Social Psychology*, 74(2), 435-452.
- Gillborn, D. (2008). Coincidence or conspiracy? Whiteness, policy, and the persistence of the Black/White achievement gap. *Educational Review*, 60, 229-248.
- Herbert, J., & Stipek, D. (2005). The emergence of gender differences in children's perception of their academic competence. *Applied Developmental Psychology*, 26, 276-295.
- Hill, C., Corbett, C & St. Rose, C., (2010). *Why so few? Women in science, technology, Engineering and mathematics*. Retrieved from AAUW website: <http://www.aauw.org/learn/research/whysofew.cfm>
- Hill, J.P., & Lynch, M.E. (1983). The intensification of gender-related role expectations during early adolescence. In J. Brooks-Gunn. & A.C. Petersen (Eds.), *Girls at puberty biological and psychosocial perspectives* (pp. 201-228), New York: Plenum.
- Hudley, C., & Graham, S. (2001). Stereotypes of achievement striving among early adolescents. *Social Psychology of Education*, 5, 201-224.

- Jencks, C., & Phillips, M. (1998). *The black-white test score gap*. Washington, D.C.: Brookings Institution Press.
- Katz, P.A., & Kofkin, J.A. (1997). Race, gender, and young children. In S.S Luthar, J.A. Burak, D. Cicchetti, & J. Weisz (Eds.), *Developmental psychopathology : Perspectives on adjustment, risk, and disorder* (pp. 51-74). New York: Cambridge University Press.
- Keller, J. (2002). Blatant stereotype threat and women's math performance: self handicapping as strategic means to cope with obtrusive negative performance expectations. *Sex Roles, 47*(3/4), 193-198.
- Kellow, J. T., & Jones, B. D. (2008). The effects of stereotypes on the achievement gap: reexamining the academic performance of African American high school students. *Journal of Black Psychology, 34*(1), 94-120.
- Kiefer, A. K., & Sekaquaptewa, D. (2007). Implicit stereotypes, gender identification, and math-related outcomes: A prospective study of female college students. *Psychological Science, 18*(1), 13-18.
- Kiefer, A. & Shih, M. (2006). Gender differences in persistence and attributions in stereotype relevant contexts, *Sex Roles, 54* (11), 850-868.
- Kurtz-Costes, B., Rowley, S. J., Harris-Britt, A., & Woods, T. W. (2008). Gender stereotypes about mathematics and science and self-perceptions of ability in late childhood and early adolescence. *Merrill-Palmer Quarterly, 54*(3), 386-409.
- Kurtz-Costes, B. E., & Schneider, W. (1994). Self-concept, attributional beliefs, and school achievement: A longitudinal analysis. *Contemporary Educational Psychology, 19*, 199-216.
- Leahey, E., & Guo, G. (2001). Gender differences in mathematical trajectories. *Social Forces, 80*(2), 713-732.
- Major, B., Sciacchitano, A. M., & Crocker, J. (1993). In-group versus out-group comparisons and self-esteem. *Personality and Social Psychology Bulletin, 19*(6), 711-721.
- Marsh, H. W. (1990). Influences of internal and external frames of reference on the formation of math and English self-concepts. *Journal of Educational Psychology, 82*, 107-116.
- Marsh, H., Trautwein, U., Ludtke, O., Koller, O., & Baumert, J. (2005). Academic self concept, interests, grades, and standardized test scores: reciprocal effects models of causal ordering. *Child Development, 76*(2), 397-416.
- Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability.

Child Development, 49, 800-814.

- Okeke, N. A., Howard, L. C., Kurtz-Costes, B., & Rowley, S. J. (2009). Academic race stereotypes, academic self-concept, and racial centrality in African American youth. *Journal of Black Psychology*, 35(3), 366-387.
- Plant, E. A., Baylor, A. L., Doerr, C. E., & Rosenberg-Kima, R. B. (2009). Changing middle-school students' attitudes and performance regarding engineering with computer-based social models. *Computers and Education*, 53(2), 209-15.
- Quintana, S.M. (1998). Children's developmental understanding of ethnicity and race. *Applied and Preventive Psychology*, 7, 27-45.
- Reid, P.T., & Roberts, S.K. (2006). Gaining options: a mathematics program for potentially talented at-risk adolescent girls. *Merrill- Palmer Quarterly*, 52 (2), 288-304.
- Robbins, J. M., & Krueger, J. I. (2005). Social projection to ingroups and outgroups: A review and meta-analysis. *Personality and Social Psychology Review*, 9(1), 32-47.
- Rowley, S. J., Mistry, R., & Feagans, L. (2007). Social status as a predictor of race and gender stereotypes in late and early adolescents. *Social Development*, 16(1), 150-168.
- Rowley, S.J., Kurtz-Costes, B., & Cooper, S. M. (2010) The schooling of African American children. In J. Meece & J. Eccles (Eds.), *Handbook of research on schools, schooling, and human development*. Hillsdale, NJ: Erlbaum.
- Ruble, T. L., Cohen, R., & Ruble, D. N. (2001). Sex stereotypes. *American Behavioral Scientist*, 27, 339-356.
- Ruble, D. N., Alvarez, J., Bachman, M., Cameron, J., Fuligni, A., Coll, C. G., et al. (2004). The development of a sense of "we": the emergence and implications of children's collective identity. In M. Bennett & F. Sani (Eds.), *The Development of the social self* (pp. 29-76). New York: Psychology Press.
- Sanders, G.S., Gastorf, J.W., Mullen, B. (1979). Selectivity in the use of social comparison information. *Personality and Social Psychology Bulletin*, 5 377-380.
- Saunders, J., Davis, L., Williams, T., & Williams, J. H. (2004). Gender differences in self-perceptions and academic outcomes: a study of African American high school students. *Journal of Youth and Adolescence*, 33(1), 81-90.
- Sailes, G. A. (1991). The myth of Black sports supremacy. *Journal of Black Studies*, 21(4), 460-487.
- Shettle, C., Roey, S., Mordica, J., Perkins, R., Perkins, R., & Nord, C., et al. (2007). *The nation's report card: Americas high school graduates: results from the 2005 NAEP*

high school transcript study. Retrieved from National Center for Education Statistics website: <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007467>

- Schmader, T., Johns, M., & Barquissau, M. (2004). The costs of accepting gender differences: The role of stereotype endorsement in women's experience in the math domain. *Sex Roles, 50*(11-12), 835-850.
- Shields, S. A., (2008) Gender: An intersectionality perspective. *Sex Roles, 51*(5-6), 301-311.
- Steele, C. & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*, 797-811.
- Steele, C. M. (1997). A threat in the air how stereotypes shape Intellectual Identity and performance. *American Psychologist, 52*(6), 613-629.
- Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relation* (pp. 33-47). Monterey: Brooks/Cole Publishing.
- Tiedemann, J., 2000. Parents' gender stereotypes and teachers' beliefs as predictors of children' concept of their mathematical ability in elementary school. *Journal of Educational Psychology 92* (1), 144–151.
- Wigfield, A., & Wagner, A. L. (2005). Competence, motivation, and identity development during adolescence In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 222-239). New York: The Guilford Press.

Table 1

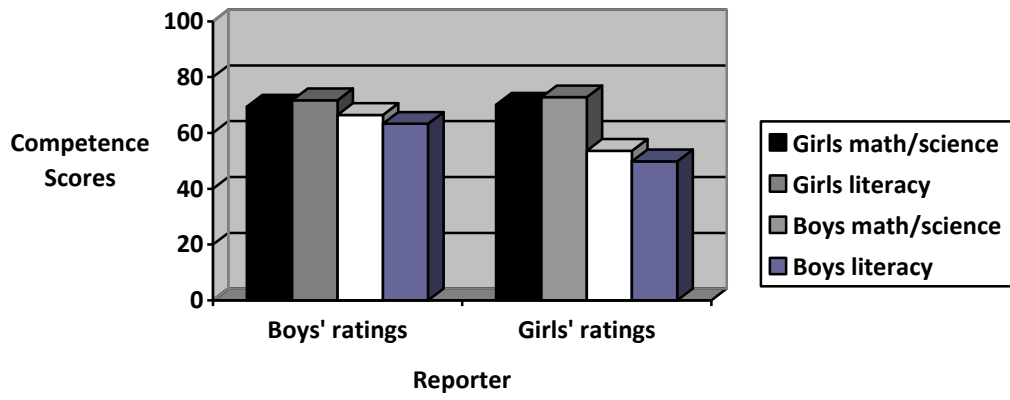
Regression Analyses Predicting Girls' and Boys' Academic Self-Concept

	Girls		Boys	
	Read/Write	Math/Science	Read/Write	Math/Science
Competence- Boys	-.19	.14	.18	.26*
Competence- Girls	-.01	.22*	.15	-.11
Competence- Whites	-.01	-.22*	-.08	-.20
Competence- Blacks	.36*	.03	.19	.29*
Course Grade	.27**	.44***	.14	.33**
Income	-.06	-.01	.08	-.05

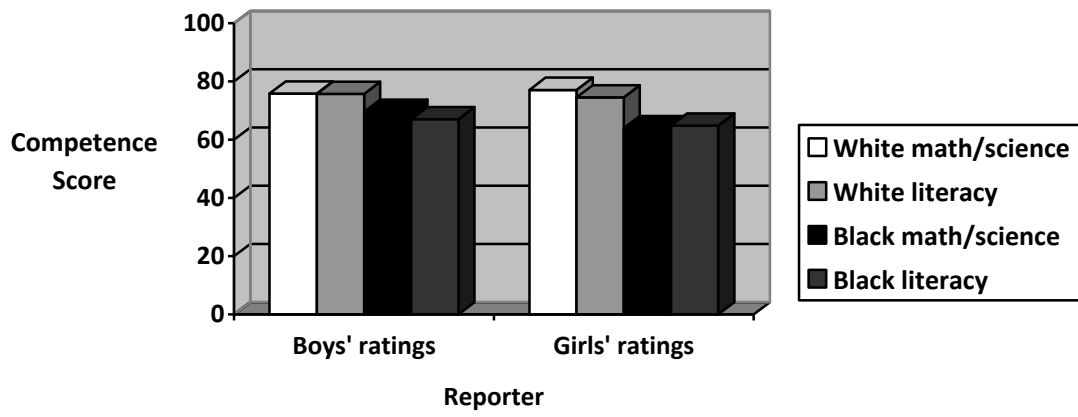
* $p < .05$

** $p < .01$

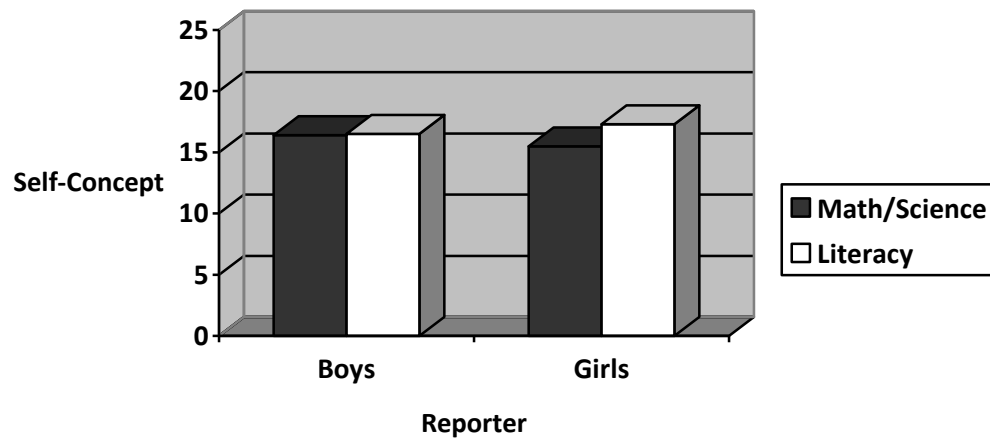
*** $p < .001$



Boys' and Girls' Mean Competence Ratings of Gender Groups



Boys' and Girls' Mean Competence Ratings of Race Groups



Gender Differences in Self-Concept