

ACADEMIC GENDER STEREOTYPES AND ACADEMIC SELF-CONCEPT OF INDIAN ADOLESCENTS

Beth Kurtz-Costes
Nikul Patel
Dana Wood

Research with Westerners suggests that by adolescence, youth are aware of gender stereotypes favoring boys in mathematics and science, and favoring girls in verbal domains. Youths' self-concepts (i.e., their perceptions of their own abilities) reflect these gender patterns. In the current study, Indian youths' gender stereotypes and academic self-concept in mathematics, science, and literacy were explored, as well as school context differences (i.e., single-gender versus mixed-gender classrooms). Tenth grade Indian students (N=86) completed measures of the competence of boys and girls in academic domains (i.e., academic stereotypes) and their Gujarati, mathematics, and science self-concepts. Boys rated boys as more competent than girls across domains, whereas girls reported no gender differences in abilities. No gender differences emerged in self-concept, but both boys and girls reported lower self-concept in mathematics and science than in Gujarati. Results of the study illustrate the need for gender-equality programs in India.

INTRODUCTION

Despite the recent economic growth and development in India, the nation continues to face large gender inequalities in access to education and occupational status. As of 2006, only two-thirds of girls ages six through 17 were enrolled in school, as compared to three-fourths of boys (Kishor & Gupta 2006, p. 20). Currently, 41% of women ages 14 through 49 have never been to school, as compared to 18% of men. Similar gender differences exist in rates of employment; women between the ages of 15 and 49 are about half as likely as their male counterparts to be employed. Partly as a consequence of educational disparities, women are not only less likely than men to be employed in India, but women who are employed receive less compensation for comparable work. According to the National Institute of Public Finance and Policy (NIPFP), the average female wage is less than 80% of the male average in urban areas, and less than 60% of the corresponding male wage in rural areas (Das 2009, p. 12). In addition to being underemployed and undercompensated, Indian women are less likely than men to hold jobs in professional, managerial, or technical positions. Taken together, these data highlight the fact that, in India, women exist as a low status group relative to their male counterparts.

Over the course of development, Indian children (like children in many Western countries) are immersed in a society where the lower status of women is normative. Continual exposure to strongly differentiated gender roles is likely to shape children's beliefs about how well males and females perform across a variety of domains. Broadly-held beliefs about social groups, such as males and females, are known as stereotypes (Ruble, Cohen & Ruble 2001, p. 340). A primary goal of this study was to examine Indian adolescents' *academic gender stereotypes*—their beliefs about how well girls and boys perform in different school subjects. Research with Western samples indicates that children's school performance and their subsequent educational and occupational outcomes are shaped in part by cultural stereotypes about differences in boys' and girls' competence in various academic domains (Colley & Comber 2003, p. 163; Miller & Budd 1999, p. 18; Nosek, Smyth, Sriram, Lindner, Devos, Ayala, Bar-Anan, Bergh, Cai, Gonsalkorale, Kesebir, Maliszewski, Neto, Olli, Park, Schnabel, Shiomura, Tulbure, Wiers, Somogyi, Akrami, Ekehammar, Vianello, Banaji & Greenwald 2009, p. 10593). Stereotypes shape motivation and performance through several mechanisms, one of which is their influence on academic self-concept. Whereas academic gender stereotypes are beliefs about the academic competence of males and females in general, academic self-concept refers to beliefs about one's own abilities in academic domains (Evans, Copping, Rowley & Kurtz-Costes 2011, p. 265; Kurtz-Costes, Rowley, Harris-Britt & Woods 2008, p. 390). A second goal of this study was to investigate gender differences in Indian adolescents' academic-self concepts.

Cultural and Status Predictors of Academic Stereotypes

Research investigating students' stereotype endorsement about gender differences in various subjects shows that both boys and girls in Western samples view literacy and art as female domains and science and sports as male domains (Nosek et al. 2009, p. 10595; Plante, Théorét, & Eizner Favreau 2009, p. 385; Rowley, Kurtz-Costes, Mistry, & Feagans 2007, p. 151). Results regarding mathematics are more mixed, but generally show that by the high school years mathematics is viewed as a male domain (Chatard, Guimond, & Selimbovic 2007, p. 1023; Hyde, Fennema, Ryan, Forst, & Hopp 1990, p. 307). Academic gender stereotypes might take a number of forms among Indian youth. First, given the pronounced gender differences in educational attainment in India, it is possible that Indian youth might perceive that boys are more capable than girls across all academic content areas. A second possibility is that stereotypes are domain-specific, following patterns found in Western countries (i.e., favoring girls and women in verbal skills and the arts, and favoring boys and men in mathematics and science). Using data from 34 Western and non-Western countries, Nosek et al. (2009, p. 10595) found that the strength of cultural beliefs about gender differences in science and language arts was positively related to the degree of gender imbalance in numbers of men and women in science careers within each country. That is, countries in which individuals reported stronger gender stereotypes also had a larger difference between the number of men as compared to the number of women in science careers. If Indian children's beliefs mirror these patterns, they may believe that academic subjects associated with high status careers (i.e., math and science) are more appropriate for boys, whereas other subjects (i.e., language arts and music) are more appropriate for girls. Yet a third possibility is that Indian adolescents' academic stereotypes (i.e., their beliefs about gender differences in academic abilities) differ according to individual and contextual factors. Two such factors are examined in this study: 1) social status as a function of gender, and 2) the gender composition of the educational setting (i.e., mixed-gender vs. single-gender schools).

According to classic social psychological theory, individual identity is heavily linked to one's social group memberships (Tajfel 1970, p. 96). All individuals are members of social groups such as gender, religion, and nationality as well as more temporary groups such as membership in a sports team. Tajfel posited that individuals have a natural tendency to favor their own group as a way of maintaining positive self-views; therefore, out-group members are viewed more negatively than in-group members. A large body of research has confirmed these ideas (e.g., Tajfel 1970, p. 100). Although this in-group bias is robust, the tendency to favor one's own group over another varies by social status (Bigler, Brown, & Markell 2001, p. 1160; Rowley et al. 2007, p. 162). Rowley and her colleagues have argued that members of low-status groups are more likely than member of high-status groups to deny negative stereotypes about their group in order to protect self-esteem. In contrast, members of high-status groups, who have less need for self-enhancement, may endorse stereotypes that reflect both positively and negatively on their social group (Rowley et al. 2007, p. 163). Accordingly, girls—who are historically of lower status than boys as a social group—should be less likely than boys to endorse stereotypes that reflect negatively on girls. In a cultural setting where boys are viewed as more competent in mathematics and science, and girls are viewed as more competent in verbal domains, boys would be expected to endorse both types of stereotypes, whereas girls would only endorse stereotypes favoring girls in verbal domains. Rowley and colleagues (2007, pp. 157-158) found status differences in endorsement of gender stereotypes in a U.S. sample: Early adolescent boys—who are of higher status than girls—reported traditional stereotypes in both math/science and verbal domains. In contrast, girls reported that girls excel in verbal domains but did not favor boys in math and science.

Because little research has examined gender academic stereotypes in Indian youth, we approached the current study with alternative hypotheses about gender differences in stereotype endorsement. Given long-term and pervasive differences between Indian men and women in educational attainment, boys might report gender differences favoring boys in both domains. Girls, in contrast, might either endorse stereotypes favoring boys, or because of in-group bias and/or their lower status, might report no gender differences in academic abilities. A second possibility is that Indian adolescents' stereotypes would mirror those of Western youth, wherein boys are expected to excel in mathematics and science and girls are

viewed as more talented in verbal domains. Based on social status theory, it would be expected that boys as the high-status gender group would endorse traditional gender stereotypes about both domains (i.e., that boys are more competent than girls in math/science, and that girls are more competent than boys in language). In contrast, girls would report that girls excel in verbal domains, but would not endorse math/science stereotypes favoring boys. We also tested whether boys' beliefs differed in a single-gender school as compared to in a mixed-gender school.

Single-Sex Schools and Gendered Beliefs

Colley and his colleagues (1994, p. 384) found that gendered patterns of students' beliefs and course choices differed according to whether students were learning in a single-gender classroom versus a mixed-gender (co-educational) classroom. These researchers posited that gender stereotypes might be weaker in single-sex schools because of fewer gender-stereotyped reinforcements. For example, within mixed-gender schools, teachers might perceive that boys succeed in math and science domains because of high ability, whereas they might believe that girls succeed in these domains because of effort. These gendered beliefs of teachers are likely to be perceived by students in mixed-gender schools, where teachers have the opportunity to show differential behavior to girls and boys. Consistent with these ideas, Colley et al. (1994, p. 383) found that girls from mixed-gender schools rated mathematics as more difficult and less enjoyable than girls enrolled in single-gender schools. Girls from single-gender classrooms choose higher levels of mathematics courses, while girls in mixed-gender schools are more likely to choose upper-level English courses. The female-stereotyped subjects of language, music, and art are higher in the preference order of boys from single-gender schools than in boys from mixed-gender schools, who report a stronger preference for the male-stereotyped subjects of math and physics (Colley et al. 1994, p. 383; Lawrie & Brown 1992, p. 136). Single-gender schools, compared to mixed-gender schools, may enable students to develop more neutral or weaker stereotypes because the absence of the other gender creates an atmosphere in which gender comparisons are less likely to occur. While textbooks might still encourage stereotypes (e.g., more men portrayed as being successful scientists than women), teacher response biases with boys and girls would not occur in single-sex schools, and therefore gender biases are likely to be more subtle than those experienced by students in mixed-gender schools. These ideas led to the prediction that students from single-sex classrooms will report less of a disparity in the abilities of boys and girls compared to students in mixed-gender classrooms. We also considered an alternative hypothesis—that students' experiences with the other gender lead them to perceive similarity rather than differences between the two genders. Particularly for boys in an all-boys school, the absence of girls might reinforce cultural ideas of the superiority of boys. In contrast, boys in a mixed-gender school would have the opportunity to witness the ability and motivation of girls, which might lead to reports of fewer differences between the two genders. Stereotypes are posited to be important for academic motivation in part because of linkages between beliefs about one's social group (in this case, one's gender group), and abilities of the individual (i.e., self-concept). Next we provide a general overview of what researchers have found about gender differences in academic self-concept.

Stereotypes and Gender Differences in Domain-Specific Self-Concept

In Western samples, students rate their own abilities in certain academic domains in a manner that is consistent with gender stereotypes: Boys typically rate their abilities in mathematics and science higher than their verbal abilities, whereas girls show the reverse pattern, and boys rate their mathematics ability higher than girls (Herbert & Stipek 2005, p. 285; Kurtz-Costes et al. 2008, p. 395; Marsh, Trautwein, Lüdtke, Köller, & Baumert 2005, p. 408). Although gender differences are consistently found in the domain-specific self-concepts of boys and girls in the United States, these beliefs do not reflect differences in academic performance. For example, even though girls' perceptions of their math ability become less positive with age, there are few gender differences in math ability during childhood and adolescence (Herbert & Stipek 2005, p. 287). Because researchers have not assessed gender academic stereotypes in Indian society, we approached the current study with two sets of hypotheses about possible

gender differences in students' self-concepts. If Indian youth hold gender stereotypes favoring boys in math and science and favoring girls in verbal domains, then we expected that students' own self-concepts would mirror those beliefs. In other words, girls would report higher self-concepts in language than in math/science, and the reverse pattern would be found among boys. Alternatively, if youth did not report domain-specific gender differences in abilities but reported that boys were more competent than girls across both domains, then we expected that boys would report higher self-concept than girls.

CURRENT STUDY

In the present study, 10th grade Indian youth from two high schools in Gujarat completed measures of self-concept and beliefs about the competence of boys and girls (i.e., academic gender stereotypes) in math, science, and Gujarati. One school was mixed-gender while the other was an all-boys school. As described above, our hypotheses were as follows:

- 1) We tested two alternative hypotheses regarding students' academic stereotypes. First, if stereotypes in India mirror those found in Western countries, we expected that domain-specific stereotypes would appear in students' reports, supporting boys in math/science and girls in literacy domains. Moreover, consistent with status theory, we anticipated that boys would report gender differences in both domains, whereas girls would report that girls are better than boys in verbal domains, and no gender differences in math/science abilities. A second, alternative prediction was that students' beliefs would favor boys across domains, with boys particularly likely to report that boys are more competent academically than girls.
- 2) We expected that individual self-concept would show parallel patterns to students' stereotypes. Namely, if Western stereotypes favoring girls in verbal domains and boys in math/science were reported, we expected that girls would report relatively higher verbal self-concept than math/science self-concept, whereas the reverse was expected for boys. Alternatively, if students' stereotype reports favored boys across domains, we expected to find similar gender differences in reports of self-concept, with boys reporting more positive self-concepts than girls.
- 3) Our third hypothesis was that students' stereotype reports would differ by school type. Once again, we tested two competing hypotheses. If differential treatment from teachers is a major factor shaping students' beliefs, then boys in the mixed-gender school would have stronger stereotypes than boys in the single-gender school. Alternatively, if experience with the other gender (i.e., witnessing the academic competence of girls) is more important in shaping beliefs, then boys in the all-boys' school would report larger differences in beliefs than boys in the mixed-gender school.

METHOD

Participants

The participants in this study were 86 tenth grade students (56 boys, 30 girls) attending two secondary schools in rural regions of Gujarat, India. Fifty-five students (25 boys, 30 girls) were enrolled at a mixed-gender school and 31 boys were enrolled at a single-gender (i.e., all male) boarding school. Both institutions were private and required a small fee for attendance.

Procedure

The measures used to assess group competencies and self-concept were part of a survey administered at the University of North Carolina at Chapel Hill in ongoing research led by the second author. The measures were translated from English into Gujarati by the first author with the assistance of a professional translator fluent in both English and Gujarati. All research materials were approved by the Institutional Review Board (IRB) at the University of North Carolina, USA. Data were collected by the first author during the summer months of 2009. Written parental consent was required for study participation. Consent and assent letters were distributed in the students' classrooms. One hundred percent of invited students participated in the study, completing self-report surveys in small groups at school. Students were told that they had the right to omit questions they felt uncomfortable answering and that they could discontinue participation without penalty. Each student received 50 rupees as a participation incentive.

Measures

Academic Gender Stereotypes: Visual analog scales (VAS) were used to assess students' beliefs about the competence of boys and girls in various domains (e.g., mathematics, Gujarati). Students were asked to place a vertical mark on a 100-millimeter (mm) line to indicate how well they believed the designated group (boys or girls) performs within each domain. Each item was composed of a verbal descriptor (e.g., "I think that in SCIENCE boys do this well") and included anchors "Not well at all" on the far left of the line (0 mm) and "Very well" on the far right (100 mm). Separate items were used to assess each domain (e.g., math, Gujarati). Items about each group (i.e., boys; girls) were presented on separate pages. For math and science, the responses to four items (i.e., Boys [Girls] find math, Boys [Girls] do this well in math, Boys [Girls] find science, Boys [Girls] do this well in science) were averaged, $\alpha = .77$ and $.61$ for ratings of boys and girls, respectively. Group competence in language was calculated by averaging the responses of two items (i.e., Boys [Girls] find Gujarati, Boys [Girls] do this well in Gujarati), $\alpha = .77$ and $.44$ for ratings of boys and girls, respectively. The use of VAS measures to assess stereotypes has been validated in other stereotype research (e.g., Kurtz-Costes et al. 2008, p. 393; Wood, Kurtz-Costes, Rowley & Okeke-Adeyanju 2010, p. 524).

Academic Self-concept: Academic self-concept was assessed with a measure developed by Nicholls (1979, p. 95). For each academic domain, a column of 25 stick figures was presented. The figure at the top of the column represented the best student in a given domain, and the figure at the bottom of the column represented the worst student in that domain. Students were asked to circle the figure that best represented their own performance in the targeted domain compared to classmates. Higher scores indicated higher academic self-concept, with scores ranging from 1 to 25. Math/science self-concept scores were created by averaging each student's responses on the math and science items, $\alpha = .83$. Gujarati self-concept scores were created by averaging the Gujarati items, $\alpha = .79$.

RESULTS

Descriptive statistics are presented in Table I. All hypotheses were tested with repeated measures analyses of variance.

Table 1
Gender Group Competence Scores and Academic Self-Concept Broken Down by School Type and Gender

Variable	Mixed-Gender School		All-Boys School
	Girls Mean (SD) <i>n</i> = 30	Boys Mean (SD) <i>n</i> = 25	Boys Mean (SD) <i>n</i> = 31
Boys' Group Competence in Gujarati	70.0 (23.9)	75.2 (14.4)	72.9 (17.9)
Boys' Group Competence in Math/Science	71.1 (18.6)	72.5 (14.4)	81.1 (14.1)
Girls' Group Competence in Gujarati	75.8 (15.9)	60.5 (14.7)	56.0 (19.8)
Girls' Group Competence in Math/Science	70.5 (16.5)	57.4 (9.5)	61.4 (16.3)
Verbal Self-Concept Math/Science	20.6 (4.7)	21.3 (3.5)	22.3 (2.0)
Self-Concept	19.0 (4.4)	20.7 (3.5)	22.8 (2.6)

Indian Adolescents' Academic Gender Stereotypes

Hypotheses regarding students' academic gender stereotypes were tested with a 2(Youth Gender) x 2(Social Group [i.e., boys and girls]) x 2(Academic Domain [i.e., language and math/science]) repeated measures analysis of variance (ANOVA), where Social Group and Academic Domain were repeated, within-subjects factors. Because we hypothesized that students' beliefs might differ across the single gender and mixed-gender schools, the first analysis was conducted only on data from the mixed-gender

school. If the first part of Hypothesis 1 was confirmed, showing results similar to those found with Western samples, then the ANOVA would yield a significant Social Group x Academic Domain interaction in which boys would be rated more positively in math/science and girls would be rated more positively in Gujarati. Status group differences in such reports would be supported by a significant Gender x Social Group x Academic Domain interaction, with boys showing traditional stereotypes in both domains, and girls reporting that girls are better than boys in Gujarati but equal to boys in math/science. Alternatively, if the second prediction in Hypothesis 1 was confirmed—namely, that boys are viewed as more competent than girls across domains—then the main effect of Social Group would be significant (reflecting that boys were viewed as more competent than girls), with a possible Gender x Social Group interaction (reflecting that such beliefs were stronger among boys than among girls). Results of the analysis were consistent with the second part of Hypothesis 1: The main effect of Social Group and the interaction of Youth Gender x Social Group were significant, $F(1, 53) = 6.35$ and 12.97 , respectively, p 's $< .01$. The main effect of Social Group reflected that boys were rated as more competent than girls in both math/science and Gujarati. The significant Youth Gender x Social Group interaction showed that whereas boys rated boys as more competent than girls ($M_{boys} = 73.8, SE = 3.45; M_{girls} = 59.0, SE = 2.29$), girls' ratings of the two genders did not differ significantly ($M_{boys} = 70.5, SE = 3.15; M_{girls} = 73.2, SE = 2.09$). None of the interactions involving Academic Domain was significant; thus, mean scores presented here are for the composite of reports for language and math/science.

Students' Beliefs about Their Own Academic Competence

The second set of hypotheses was tested with a 2(Youth Gender) x 2(Academic Domain [i.e., language and math/science]) ANOVA in which Academic Domain was a repeated measures, within-subjects factor representing students' academic self-concept in math/science and Gujarati. Once again, because student reports might differ across school type, and because the sample did not include an all-girls' school, we did not include boys from the all-boys' school in the analysis. A significant Gender x Academic Domain interaction showing that girls reported relatively higher Gujarati self-concepts and boys reported higher math/science self-concepts would support the first alternative in Hypothesis 2, showing similar results to those found with Western samples. A significant main effect of Gender favoring boys would support the hypothesis that prevalent cultural beliefs in India portray boys as more competent than girls across academic domains. Neither the main effect of Gender nor the Gender x Academic Domain interaction was significant, p 's $> .15$. Instead, the main effect of Academic Domain was significant, showing that both boys and girls, on average, reported greater competence in Gujarati ($M = 21.0, SE = 0.56$) than in math and science ($M = 19.8, SE = 0.54$), $F(1, 53) = 7.59, p = .008$.

Comparisons of Students' Beliefs across School Types

In order to test Hypothesis 3, we compared scores of boys in the mixed-gender school to those of boys in the all-boys' school. To test possible school-type differences in stereotypes, we conducted a 2(School Type) x 2(Social Group) x 2(Academic Domain) repeated measures ANOVA on boys' group competence scores. The two levels of School Type were boys at the all-boys' school and boys at the mixed-gender school. As reported above, the two Social Groups were beliefs about the competence of girls and beliefs about competence of boys, and the two levels of Academic Domain were competence in Gujarati and competence in math/science. The main effect of Social Group and the School Type x Academic Domain interaction were significant, $F(1, 53) = 47.4$ and 11.2 , respectively, p 's $< .01$. Overwhelmingly, boys in both schools rated boys as more competent than girls across academic domains ($M_{boys} = 75.4, SE = 1.86; M_{girls} = 58.8, SE = 1.83$). The School Type x Academic Domain interaction showed that boys in the all-boys school rated students of both genders as more competent in mathematics and science than in Gujarati ($M_{Math/Science} = 71.2, SE = 1.97; M_{Verbal} = 64.4, SE = 2.26$). In contrast, boys in the mixed-gender school reported that students are equally competent across the two academic domains, ($M_{Math/Science} = 64.9, SE =$

2.15; $M_{Verbal} = 67.8, SE = 2.48$). Ratings of math/science skills were greater in the all-boys' school than in the mixed-gender school, whereas ratings of verbal skills did not differ across the two school types. We examined possible school-type differences in self-concept with a 2(School Type) x 2(Academic Domain) repeated measures ANOVA on boys' self-concept scores. As above, the two levels of School Type were boys in the mixed-gender school and boys in the all-boys' school; Academic Domain was a within-subjects factor with the two levels of Gujarati and math/science self-concept. The main effect of School Type was significant. Across academic domains, boys in the all-boys' school had higher self-concepts than boys in the mixed-gender school, $F(1, 53) = 5.03, p = .029$. Neither the main effect of Academic Domain nor the School Type x Academic Domain interaction was significant, $p's > .15$.

In summary, results did not support the prevalence of domain-specific gender stereotypes about academic ability in these Indian youth. Instead, students' reports of group competence showed that boys perceived boys as more competent than girls in both domains, whereas girls did not report gender differences in skills. Those results did not differ across the two types of schools: Boys in both schools overwhelmingly viewed boys as more capable than girls academically. Analyses on students' perceptions of their own abilities (i.e., their self-concepts) reflected that on average, youth viewed themselves as more competent in verbal skills than in mathematics and science. Boys in the all-boys school reported higher self-concepts in both domains than boys in the co-educational school.

DISCUSSION

Whereas a large body of research has shown that many Western youth and adults hold academic stereotypes favoring girls in verbal domains and boys in mathematics and science, in the current study, 10th grade Indian boys viewed boys as more capable than girls across subjects. Girls and boys did not differ in their perceptions of their own abilities, but students of both genders viewed themselves as more competent in verbal domains than in math and science. According to Colley and colleagues (1994, p. 379), gender-stereotyped beliefs may be reinforced in the classroom, thereby strengthening stereotypes. However, boys in the all-boys' schools had gender stereotypes similar to those of boys in the mixed-gendered school. Both groups viewed boys as more competent than girls across academic domains.

Although boys rated boys as stronger academically than girls, girls reported no gender differences in academic skills. These results might reflect girls' accurate perceptions of no gender differences in academic abilities, and are also consistent with social status theory, which posits that girls as the low-status group would be less likely than boys to report stereotypes that reflect negatively on themselves. The beliefs of boys in our sample seem to reflect the broader cultural and societal milieu, where it is much less likely for girls to pursue higher education than boys or to aspire to professions that require schooling. The endorsement and persistence of these stereotypes over time may have negative impact on girls' ability to enter certain male-dominated occupations.

Boys' Beliefs about Gender Differences in Academic Abilities

Boys in both the mixed-gender and the all-boys' schools viewed girls as less competent than boys across academic domains. These negative perceptions of girls can be detrimental and have life-impacting results if endorsed during adulthood (Miller & Budd 1999, p. 30). Students in single-sex classrooms, where traditional gender norms are not reinforced tend to have more gender-neutral views of ability and are more likely to engage in academic and extra-curricular activities typically associated with the opposite sex than are students in classrooms where gender is a salient factor (Colley et al. 1994, p. 383). The results of this study illustrate the need for the development of curricula in India that promote the equality of the sexes.

Historically, the stereotypes endorsed by Indian youth may be more similar to those of British youth than those endorsed by students in the United States. British society has traditionally viewed men as talented in verbal domains as well as in math and science domains. Since Great Britain colonized India more than 200 years ago, India's educational institutions have been strongly influenced by British academic

traditions. In 1835, Thomas Macaulay wrote his famous Minutes in which he criticized almost everything Indian that was academically related (Chand 2007, p. 1). Macaulay denounced Indian culture and practices, and praised everything Western, and on this basis he advocated the adoption of a national system of education for India that would serve the interests of the British Empire. Because Macaulay's ideas were adopted as the cornerstone of all education programs during the British Period in India, Indian culture and philosophy receded to the background, vernacular languages began to be neglected, Western culture made massive strides, English became the medium of instruction, Western arts and sciences became popular, and English schools began to be established (Chand 2007, p. 7). Many generations of Indians were educated within British-based educational systems. India earned its independence in 1947; however, the influence of the British remains through English Mediums and unchanged education reforms that occurred during the British rule. The belief that boys excel in verbal domains compared to girls is a stereotype held in Great Britain, but is not usually endorsed in the United States. Thus, the current results mirror the historical British view favoring boys and men in verbal domains.

Gender Differences in Indian Adolescents' Academic Self-Concepts

The second goal of this study was to examine gender variation in Indian youths' self-concepts in math/science and language (specifically Gujarati). Girls and boys did not differ in their perceptions of their own abilities, but students of both genders viewed themselves as more competent in verbal domains than in math and science. According to Colley and colleagues (1994, p. 380), gender-stereotyped beliefs may be reinforced in the classroom, thereby strengthening stereotypes. However, boys in the all-boys schools had gender stereotypes similar to those of boys in the mixed-gendered school: Both groups viewed boys as more competent than girls across academic domains. This result suggests that forces outside the classroom (e.g., women's lower social status and weaker representation among India's educated) shape adolescents' beliefs about gender differences in academic performance. Although math and science are subjects that are highly valued and emphasized in Indian culture, students had higher self-concept scores in language than in math and science. Because students are rigorously tested and compared with one another in math and science, the testing and high pressure to perform might cause students to have lower math/science self-concepts as compared to language, which is not tested as frequently nor as extensively emphasized in Indian culture. Public rankings based on final exam grades and more testing may demoralize students, leading them to doubt their abilities in that subject compared to subjects in which they are tested less frequently. Not only might testing be a factor, but the larger societal value placed on math/science may cause parents and guardians to examine deficiencies in math/science performance more than deficiencies in language performance. Therefore, students may receive more feedback from non-school personnel that may influence their self-concept in those subjects. For the most part, anticipated differences between the two types of schools were not found. One school difference that did emerge was that boys from the all-boys school reported higher self-concept scores than boys from the mixed-gender school. These results suggest that context may play a role in determining the self-concept of students. However, our results should be interpreted cautiously because only one school of each school-type was included in our sample, and the two schools differed in other ways. Other context factors such as school philosophy towards the academic subjects might explain the fact that boys in the all-boys' school had higher self-concepts in both domains than boys from the mixed-gender school.

RECOMMENDATIONS FOR EDUCATIONAL POLICY

Beliefs about gender inequality can be detrimental for a developing nation such as India. The persistence of gender stereotypes can divide the labor force into gendered categories, which may affect educational trajectories and hiring practices. As a result, associations between a particular gender and a profession may become more prevalent. One point of intervention to combat such disparities is the school setting. However, the school should not be the sole point of intervention (Nosek et al. 2009, p. 10596). According to Nosek and colleagues (2009, p. 10596), implicit gender stereotypes and gender gaps in scientific

engagement are mutually reinforcing; a national policy that addresses both these issues simultaneously must be developed in order to reduce the effects of gender stereotypes. Nosek et al. state that “education campaigns attempting to bolster women’s participation and performance must overcome the pervasive implicit stereotypes that are already embodied in individuals’ minds” (pp. 10596-10597). Educational campaigns, which have had some success in the United States in increasing the numbers of girls and racial minority individuals who study science, can change the status quo in the current stereotypes of Indian students and create a shift towards reducing gender stereotypes. Beyond classroom practices, changes should be made in national policy to promote the development of an educational system that emphasizes language and arts skills as much as it values mathematics and science. Such changes might be difficult to convey since India has become prominent for its production of technical experts who excel in math and science; nevertheless, a curriculum that promotes employment opportunities related to the arts and languages as well as mathematics and science will promote the talents and interests of all citizens.

SUGGESTIONS FOR FUTURE RESEARCH

Additional research should be conducted to replicate the current findings, to examine gender stereotypes in other age groups, and in other regions of India. In addition, school characteristics should be studied to better understand contextual factors that shape students’ beliefs. In the current study, only one mixed-gender and one all-boys school were surveyed, limiting the ability to generalize the results. Moreover, no girls from single-sex all-girls schools were successfully recruited for the project. It is possible that such an environment might cushion girls from the potential negative effects of boys’ academic stereotypes. Future research should also examine socio-economic differences in students’ beliefs. Because large numbers of middle- and upper-class women enjoy higher education and high occupational status, gendered beliefs favoring boys might be mostly prevalent among working-class Indians. No socio-economic status information was collected in the current study, and reliable information about average income level per household for that region could not be located. Therefore, it is unknown to what extent these results generalize to other socioeconomic status groups as well as to other regions of the country. Children’s motivational beliefs and eventual occupational choices are shaped by their parents, teachers, and broader cultural forces (Jacobs, Chhin, & Bleeker 2006, p. 402; Nosek et al. 2009, p. 10595; Tiedemann, 2000, p. 147). Thus, an important avenue of future educational research in India would be to examine the pervasiveness of gender academic stereotypes among Indian adults and avenues to change them. Such research would provide important information about the development of achievement motivation in Indian youth, as well as the reasons underling gender disparities in Indian educational attainment and occupational choices.

REFERENCES

- 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, 1151-1162.
- Chand, J. (2007) *Education in India during the British Period*. Shipra Publications, New Delhi.
- Chatard, A., Guimond, S. & Selimbovic, L. (2007) “How good are you in math?” The effect of gender stereotypes on students’ recollection of their school marks. *Journal of Experimental Social Psychology* 43, 1017-1024.
- Colley, A. & Comber, C. (2003) Age and gender differences in computer use and attitudes among secondary school students: What has changed? *Educational Research* 45, 155-165.
- Colley, A., Comber, C., & Hargreaves, D. (1994) School subject preferences of pupils in single sex and co-educational secondary schools. *Educational Studies* 20, 379-385.
- Das, T. (2009) *Unemployment, Poverty and Gender Inequality in India- Trends, Issues and Emerging Challenges*. Retrieved from Ministry of Finance, India website: <http://www.scribd.com/doc/17454322/Employment-Poverty-and-Gender-Equality-in-India>
- Evans, A. B., Copping, K. E., Rowley, S. J. & Kurtz-Costes, B. (2011) Self-concept in Black adolescents: Do race and gender stereotypes matter? *Self and Identity* 10, 263-277.

- Herbert, J. & Stipek, D. (2005). The emergence of gender differences in children's perceptions of their academic competence. *Journal of Applied Developmental Psychology* 26, 276-295.
- Hyde, J. S., Fennema, E., Ryan, M., Forst, L. A. & Hopp, C. (1990) Gender comparisons of mathematics attitudes and affect: A meta-analysis. *Psychology of Women Quarterly* 14, 299-324.
- Jacobs, J. E., Chhin, C. S. & Bleeker, M. M. (2006) Enduring links: Parents' expectations and their young adult children's gender-typed occupational choices. *Educational Research and Evaluation* 12, 395-407.
- Kishor, S. & Gupta, K. (2006) *Gender equality and empowerment in India* (NFHS-3). Ministry of Health and Family Welfare, Government of India. Retrieved from <http://www.nfhsindia.org>
- Kurtz-Costes, B., Rowley, S. J., Harris-Britt, A. & Woods, T. A. (2008) Gender stereotypes about mathematics and science and self-perceptions of ability in late childhood and early adolescence. *Merrill-Palmer Quarterly* 54, 386-409.
- Lawrie, L. & Brown, T. (1992) Sex stereotypes, school subject preferences, and career aspirations as a function of single/mixed sex schooling and presence/absence of an opposite sex sibling. *British Journal of Educational Psychology* 45, 257-267.
- Marsh, H. W., Trautwein, U., Lüdtke, O., Köller, O. & Baumert, J. (2005) Academic self-concept, interest, grades, and standardized test scores: Reciprocal effects models of causal ordering. *Child Development* 76, 397-416.
- Miller, L., & Budd, J. (1999) The development of occupational sex-role stereotypes, occupational preferences, and academic subject preferences in children at ages 8, 12 and 16. *Educational Psychology* 19, 17-35.
- Nicholls, J. G. (1979) Development of perception of own attainment and causal attributions for success and failure in reading. *Journal of Educational Psychology* 71, 94-99.
- Nosek, B.A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., Bar-Anan, Y., Bergh, R., Cai, H., Gonsalkorale, K., Kesebir, S., Maliszewski, N., Neto, F., Olli, E., Park, J., Schnabel, K., Shiomura, K., Tulbure, B. T., Wiers, R. W., Somogyi, M., Akrami, N., Ekehammar, B., Vianello, M., Banaji, M. R. & Greenwald, A. G. (2009) National differences in gender-science stereotypes predict national differences in science and math achievement. *Proceedings of the National Academy of Sciences* 108, 10593-10597.
- Plante, I., Théorét, M. & Eizner Favreau, O. (2009) Student gender stereotypes: Contrasting the perceived maleness and femaleness of mathematics and language. *Educational Psychology* 29, 385-405.
- Rowley, S. J., Kurtz-Costes, B., Mistry, R. & Feagans, L. (2007) Social status as a predictor of race and gender stereotypes in late childhood and early adolescence. *Social Development* 16, 150-168.
- Ruble, T. L., Cohen, R. & Ruble, D. N. (2001) Sex stereotypes. *American Behavioral Scientist* 27, 339-356.
- Tajfel, H. (1970) Experiments in intergroup discrimination. *Scientific American* 233, 96-102.
- Tiedemann, J. (2000) Parents' gender stereotypes and teachers' beliefs as predictors of children's concept of their mathematical ability in elementary school. *Journal of Educational Psychology* 92, 144-151.
- Wood, D., Kurtz-Costes, B., Rowley, S. J., & Okeke-Adeyanju, N. (2010) Mothers' academic gender stereotypes and beliefs about sons and daughters in African American families. *Journal of Educational Psychology* 102, 521-530.