The Effects of Single Sex Classroom on the Academic Achievement and Perceived Ability of Seventh Grade Girls

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Submitted in Partial Fulfillment of the Requirement
for the Degree of Master Education

Summer 2002

Goucher College
The Graduate Program

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Abstract

The purpose of this study was to determine if placing girls in a single-sex classroom would increase scholastic aptitude and confidence of seventh grade girls. Twenty-five girls from a suburban, predominantly African-American school were surveyed regarding their views on science. Each set of these students was given a survey divided into present, past, and future questions regarding their views on science. After the questionnaire was done each person's composite score was calculated and rated according to female present (FEMP) versus coeducation present (COEDP), female future (FEMF) versus coeducation future (COEDF) and female opinion (FEMO) versus coeducation opinion (COEDO). The major findings show that a comparison of the grade point averages of the two classes was not significantly different, with the means of the coeducational class being slightly higher than the females only class (2.935 versus 2.744). The null hypothesis that there would be no significant differences between the all-female class and the coeducational class was partially confirmed. There were no significant differences between the two classes on GPA and present, future, or opinion questions. Further research on this point is recommended, for if the difference is true and continues to favor the coeducational class, then a performance difference could not used to justify having an all female class.

CHAPTER ONE

INTRODUCTION

The purpose of this study is to determine if placing girls in a single-sex classroom would increase science scholastic aptitude and confidence of seventh grade girls. Middle school is often the place where students develop an interest in science. National statistics from various sources such as the American Association of University Women (1992), National Center for Education Statistics [NCES] (1997) and the National Science Foundation (1994) and College Bound Seniors (1998), have found a persistent gender gap in science participation and achievement. Although women have made great strides over the past 30 years, the scarcity in the sciences remains (Joyce & Farenga, 2000). Males are three to four times more likely to pursue a degree in physical science, mathematics, computer science, or engineering. Females who do pursue science generally pursue typical female roles such as nursing (Joyce & Farenga, 2000). Because of the gender gap in the sciences, many organizations have made attempts to eliminate the gap. "Expect the best from a girl" is a program by Mary Bullock (1996) that encourages girls to aspire for the male-dominated programs often perceived by females as difficult. Many times girls do not pursue science because of stereotyping of who should pursue science. Often these stereotypes began at home. Girls have indicated that their parents have encouraged them to play with dolls and dainty items instead of chemistry sets or computer programs (Bullock, 1996).

Another reason for girls not wanting to pursue science is being ignored by their teachers (Bullock, 1996). Teachers often encourage boys to answer more questions in class than girls, possibly because girls are usually better behaved than boys and are

overlooked because of their good behavior. Boys naturally receive more attention because they are active and require more attention. Teachers often get excited when a boy answers a question because they are happy that the boy is not causing a disruption. The constant unintentional over-looking of the performance of girls by teachers debilitates girls' self-esteem. Girls begin to feel that they are incapable of handling the sciences and therefore do not believe that they should pursue that type of work (Bullock, 1996).

Hypothesis

The null hypothesis of no difference academically between the single-sex class and the coeducational class will be examined. Furthermore, there will be no difference in the perceived capability of women in science between the two participating classes. It is expected that there will be no difference academically between the single-sex and the coeducational class, but there will be a difference in perceived ability between the single-sex and the coeducational class. Perceived ability, the thoughts of what one can do, will be significantly higher in the single-sex class than the coeducational class.

Operational Definitions

A single sex classroom is a classroom with standard level female students.

A coeducational classroom however is a classroom with standard level male and female students.

Perceived "capability" of women in science refers to first quarter grade point averages of students in single sex classroom and coeducational classroom.

Perceived "ability" is defines as students' feelings of what that person can do in science.

CHAPTER TWO

REVIEW OF THE LITERATURE

In this review of the literature, the theoretical and experimental studies related to the relationship between gender and attitude in students' scholastic aptitude in science will be reviewed. In particular section one focuses on the underrepresentation of women in science. Section two focuses on factors that affect girls pursuing science. The third section examines interventions to reduce the gap in gender in science.

Underrepresentation of Women in Science

This section discusses the underrepresentation of women scientists in the work environment. Statistical data showing the gap of women in the sciences and reasons for the deficit of women in the sciences will be discussed.

Statistics and Trends

> Rohrer and Welsch (1998) stated that "according to the U.S. Department of Education's National Center for Education for Education Statistics [NCES] although almost half the American Labor force are women (ages 25-64), they comprise only 8% of all United States engineers, 27% of the natural scientists, 32 % of the mathematical and computer scientists and only 9% of the physicists" (p288).

There are many reasons for the smaller number of females in the mathematics and sciences. One reason for this difference in career choices between genders is related to the confidence level of young women when they are in the middle school level (Rohrer & Welsch, 1998). Rohrer and Welsch also give reference to a study done by Strauss and Subtonik (1994) which states that on a scale form 1 to 4, 4 being usually comfortable, males averaged 3.1 and females 2.8 in their comfort level for sharing answers orally. The level of confidence before taking an exam is 2.6 for males and 2.1 for females. Perception of ability to be successful in math increases with age. 57% of the seventh

girls reported being good in math compared to 64% of the boys. By the eleventh grade the gap increased by 48% of girls compared to 60% of boys.

According to Sadker (1999) the math and science gap between boys and girls is getting smaller due to national attention focused on the preconceived notions that boys were smarter in those subjects than girls. During the 1990's, female enrollment increased in science and math and girls are now more likely to take chemistry and biology. In 1995, 46% of finalists of the Westinghouse Science Talent Search finalists were females whereas during the 1940's females comprised 26% of participants. The numbers of females taking math and science classes have dramatically increased. In a NCES study done in 1994, a greater percentage of females than males took algebra I, geometry, algebra II, biology, and chemistry. The same percentage of females and males took trigonometry and calculus. More females took chemistry than male by 59% to 53%, but physics still remains a male-dominated subject.

Recent books and studies indicate that school breaks girls' spirit (Saltzman, 1994). The dynamics of a classroom are often set by how teachers respond to their students. Often boys early on receive the attention of teachers due to unruly behavior. Teachers are not as attentive to girls as to boys because girls are more well behaved. Girls are usually praised for their neat handwriting and neat projects. Due to this repeated pattern, girls' self esteem erodes in early adolescence, and girls turn away from math and science. For example, Marie Nolan, a teacher in suburban Atlanta gives an account of boys in chemistry classes who are eager to conduct experiments whereas, girls are not comfortable lighting a Bunsen burner. A researcher using longitudinal data sets to follow students over time found that boys in middle school were more likely to have

attended a computer club or talked to a scientist. The data also showed that boys in middle school may already spend a lot of time on the computer or may even have a microscope at home. By the tenth grade boys were likely to have conducted their own science experiments. Girls in high school spend considerable time on their math and science homework. The gap of achievement in science closes more in high school; but girls start out with a deficit in math and science activities (Education Digest, 1998).

Testing is another area that shows a gap. Boys outscore girls in science achievement tests and boys are more likely to take advanced placement courses in science and receive college credit (Sadker, 1999). The National Assessment of Educational Progress (NAEP) has assessed knowledge of 9, 13, and 17 year olds in science and other courses for years (Education Digest, 1998). Girls and boys have similar math and science proficiency scores at nine years of age. According to the research, a gender gap in science proficiency scores begins to appear at age 13. Since 1970, 13-year-old boys have outperformed girls by scoring 5 scale points higher on the assessment. The gender gap in science proficiencies of male and female 17 year olds has gotten smaller. However, 17-year-old females scored lower on the 1994 proficiency assessment than in 1969 despite improvement in average proficiency score between 1986-1994. Although math and science are interrelated, girls generally fall behind in science before math. "Women score lower on standardized science exams by grade 7 and on math exams by grade 10" (Education Digest, 1998, pg 1).

The pool of talent from which the nation's future scientists and engineers come is largely formed in high school (Education Digest, 1998). In order to prepare for science careers, students must enroll in highly accelerated courses while in high school. Gifted

and talented programs often identify girls in the elementary school level before they do boys, but by the tenth grade girls drop out of these programs at a higher rate than boys. Often more boys are enrolled in more gifted math and science programs whereas girls are enrolled in gifted language arts programs (Sadker, 1999). To prepare the students for accelerated courses in high school, students must be exposed to science in middle school.

Some educators believe that the difference in ability level contributes to the gap in science course selection. Joyce and Farenga (2000) conducted research on the deficit in science course selection of girls. The research used the TEST of Science-Related Attitudes (TOSRA) in order to assess science related attitudes. That test is designed to measure seven distinct attitudes of students in middle school and high school (Joyce & Farenga, 2000). The results of the t-test showed no significant difference between the number of science courses selected by average-ability students and high-ability students. Both groups have the same view of their future in science courses regardless of the academic level. These findings suggest that gender may be more related to science course selection than ability. The three subscales, normality of scientists, enjoyment of science lessons, and leisure of interest in science were all significantly related to the number of courses that high-ability young girls selected. Normality of scientists however is the primary predictor that suggested the high ability girls' agreement with the traditional roles of scientists that negatively affected their science course selection (Joyce & Farenga, 2000). On the contrary the regression model for average ability girls identifies enjoyment of science lessons as the sole predictor of science courses selected accounting for only 17% of the variance (Joyce & Farenga, 2000).

Factors that Affect Girls' Decisions to Pursue Science

This section discusses factors that affect girls' decisions to pursue science which result in the scarcity of women scientists working in professional fields in the United States today. Issues related to reasons women choose not to pursue careers in science, societal and family expectations for women, and academic challenges for women will be addressed.

Reasons Women Do Not Pursue Science

Although more women are entering science fields, there still is a significant lack of women scientists in the United States (Joyce & Farenga 2000). In a conference addressing women scientists, Sonnert (1998) links the scarcity of women scientists what are called "leaks." Sonnert states that the many stages of making a scientist can be referred to as a pipeline, and this pipeline is known to leak. Sonnert explains leakage as students dropping out of science and few scientists dropping into science. Often the drop outs in science are disproportionately female. The following factors contribute to leaks in the science pipeline: influence of family, school, and individual standpoint.

The first factor Sonnert (1998) mentions is family influence. Parental encouragement of females choosing a science career is a crucial process. In addition, research has shown that differences in achievement orientation and self-confidence are to a considerable extent formed at an early stage and may influence men's and women's later career and life choices. Bullock (1996) gives four recommendations for encouragement of girls: risk taking; studying math and science; and highlighting female role models. Bullock gives an example of requiring her learning disabled daughter to take extra tutoring after school in addition to help in the classroom and to participate in the swim

team in the third grade. Although apprehensive about the extra activities, the challenges helped her to excel in school and she even won her first swim meet at eight years old. By the sixth grade when her tutoring ended she was elected student body vice-president and she was an A/B student. The seventh and eight grades are a vital time for math and science in the United States and girls should be encouraged at this time.

> "Many schools are working on the problem of gender equity in the classroom, from pre-kindergarten to graduate school. Educators and teacher are increasingly aware of the sexual stereotyping that persists in American education," (Bullock, 1996, p7).

The academic environment has a tremendous impact on shaping individuals for the future. During school age, especially during secondary school, females may also experience a subtle distancing from academic achievement in general and from achievement in the sciences in particular due to negative comments or lack of support from teachers and peers. In elementary school girls score higher than boys on standardized tests but in junior high and senior high the opposite occurs (Bullock, 1996). Interest in science is discouraged and math aptitude disappears. Boys are far more recognized in the classroom than girls even when girls' hands are raised. Although this behavior is subtle and unintentional, it is debilitating to girls' self-esteem. Such behavior also has implications for woman's lives such as limited participation by woman in various important fields such as science. Bullock states that higher expectations are influential in a student's life, noting that parents and educators can help change the underachievement of girls.

In many colleges, young women with scientific aspirations are viewed as aberrations. The desire to be popular and peer pressure may deter them from taking the first steps in a science career. Women's colleges may be more hospitable to women's

science aspirations, whereas co-educational colleges have taken a skeptical view. Women taking science courses may experience a classroom atmosphere in which they face varying degrees of neglect or hostility from both their co-students and the faculty.

According to Sonnert (1998), recent findings point to the importance of faculty-student interaction in supporting women's attachment to the sciences. Evidence also suggests that women receive less encouragement from faculty than their male peers. Sonnert discovered in his research that more women than men reported that a lack of encouragement from teachers or counselors had been a serious problem for them. He also discovered that women undergraduates in mathematics and physics at a major research university were significantly less likely than their male peers to report that a professor had taken a special interest in them as a student.

Women continue to face a wide array of gender-specific obstacles, ranging from insufficient financial support and lack of research assistantships to more subtle factors, such as an aggressive and hostile milieu and a lack of encouragement as well as a lack of or lower quality mentoring (Sonnert, 1998). Women graduate students have been reported to have much lower self-confidence than men, even if their grades are equal to or better than the men's grades. As career paths outside the academic setting are becoming more widespread among American scientists, the special challenges and opportunities for women in non-academic jobs call for intensified scrutiny. Many married women scientists face the challenge of coordinating the often conflicting demands of three clocks, their own career clock, their partner's career clock and their own biological clock.

Girls often do not pursue science classes because of their own perception of who should be enrolled in science classes. Motivation is a key component of learning science. DeBacker and Nelson (2000) conducted a study in which motivation to learn was of interest because of the relationship between motivation, cognitive engagement, and conceptual change. Conceptual change is often too hard to accomplish in science education because conceptual change is unlikely to occur if students do not engage new information at a sufficiently deep level to realize there are conflicts between new and existing knowledge. Decisions to engage in effortful learning may be affected by the individual students' motivation for learning concluding the value of the task, their goals for engagement in the activity, their beliefs about the nature of the task. Performance goals and learning goals are two primary academic goals that have been identified in motivation. Learning goals, also known as mastery or task goals, focus on mastering a task, and performance goals focus on one's competence and avoiding the appearance of incompetence. Debacker and Nelson (2000) make reference to Meece and Holt (1993) who reported that fifth and sixth grade science students with higher learning goals scores have higher levels of cognitive engagement and more effort than those with lower scores. Debacker and Nelson (2000) found that students' effort, engagement, and achievement in mathematics and science are related to the extent to which they pursue learning and performance goals.

In addition to learning goals, perception also has an effect on motivation to learn. "Given the impact of students' perceived ability on their motivation to learn, one should understand how factors such as gender, class type and achievement level are related to perceived ability" (Debacker & Nelson, 2000, p.2). Among the many findings, perceived

instrumentality and perceived ability stood out as particularly important. Stronger perceived instrumentality was reported by physical science students and higher achieving students than by biological science students and lower achieving students. Higher ability students, male students, and physical science students had higher scores on perceived ability than did female students and biological science students (Debacker & Nelson, 2000). Debacker and Nelson make reference to Bandura (1986) who suggested that this is evident because academic achievement and perceived ability are reciprocally related so that higher achievement boosts a student's perceived ability and the resulting confidence supports the students in pursuing for and maintaining high achievement. Debacker and Nelson were especially concerned after their study because of girls reporting lower perceived ability than boys regardless of achievement level and science class type. One common explanation is that girls' self-confidence in science is eroded by the belief that science is a male dominated subject.

Varieties of Methods of Encouraging Girls into Science

This section discusses strategies implemented to decrease the deficit of women in the sciences. Programs, school type, and classroom type are interventions that will be addressed.

Barlow (1999) makes reference to Cairns (1990), Granlese and Joseph (1993) all concluded that single-sex education is associated with benefits for self-esteem and locus of control (a person's sense of how environment hinders or facilitates his or her goals). Some other studies have shown that girls in a single sex school have stronger preferences for math and physics than in coeducational schools. Some schools created single-sex

math and science classes to eliminate the aggressiveness and male-student favoritism by teachers (Barlow, 1999).

The Steps program is an all girls camp whose purpose is to expose women to opportunities for technical careers early enough to influence their choices of science, math, and technical courses in middle and high school. Dr. Peter Heimdahl, camp director of STEPS and associate dean at University of Wisconsin –Stout, Menomonie, the birth place of STEPS, said, "There are very, very, few women involved in technical and engineering careers. We decided then to do something about it..." (Advanced Materials & Processes, 69, 1998). This program targets girls who have just completed grade 6 and exposes them to technical activities that may inspire them to pursue a technical career later on in life. This program was a one-week tuition program that included four one week session in July 1997. 160 girls entering grade seven were accepted on a first-come first serve basis; 40 girls attended each weekly session. Feedback indicated a positive change in attitude toward technical and engineering careers. The girls were questioned on their knowledge and goals with a questionnaire given when they arrived at camp and when they left camp. The girls left the camp with a good understanding of the roles of a scientist and engineer in comparison to only half knowing these roles when the camp started. Also in camp the number of girls who reported that they wanted to pursue a technical career had doubled. The university plans to track the progress of the girls who participate in the STEPS program. The university will send a letter to sophomore level girls to ask them what courses they took and what courses they plan to take as well as college plans and will ask them if STEPS influenced their decision (Advanced, 69).

The Lake Tahoe Watershed project, funded by the Department of Energy was a two year project designed by educators at the Sierra Nevada College. The focus of this project was to provide a non threatening environment in which girls could learn from female scientists and science teachers who were models of successful women in math or science careers. At the close of the program girls expressed their views on the program through evaluations. The girls indicated that they now felt more confident in their ability to combat math and science and they understood how math and science are related (Rohrer & Welsch, 1998).

The Omowale School, a member of the Independent Black School Movement, has adopted a program designed to nurture the potential in the African American child. This is response to the realization that African American females are not pursuing careers in science due to lack of tools to negotiate sexism and racism that undermine their belief in ability to achieve in science (Adenika-Morrow, 1996). The school took a partnership with science, mathematics, and engineering clubs at colleges and universities. Volunteers from the university clubs shared autobiographical experiences with the students at the school. The intent was to allow the students to see older mentors as themselves with the hopes of increasing the interest of the younger student to pursue careers in science.

Several studies show that self-esteem in girls in a single sex environment is higher than in a coeducational environment (Haag, 2000). Some schools created single-sex math and science classes to eliminate the aggressiveness and male-student favoritism by teachers (Barlow, D, 1999). Garrison Forest Middle School, a female school located in Owings Mills, MD, wanted to dispel the myth and formed a partnership with the Living Classroom Foundation in order to track girls who would work in science projects for

three years. The hope is that by the ninth grade these girls would form a positive idea about science and be interested in pursuing science careers (Baltimore Sun, 2001).

Summary

There has been a great deal of research interest in reducing the gender gap between males and females in science. Typically science is perceived to be a male domain and educators are especially trying to erase that perception. Even as girls have high scholastic ability that is comparable to boys, they still lack self-confidence in science. Research has suggested that the perception of girls can be changed and initially that perception needs to be changed starting with the family. Next teachers and educators can encourage girls as much as possible so that they will want to pursue science and will have an innate level of confidence that will lead them to success in the sciences.

CHAPTER THREE

METHODS

Design

The study was a quasi-experimental design. In a quasi experimental design, a researcher does not randomly assign individual participants to groups. This usually happens in school because in order to receive permission to conduct a study, existing classrooms must stay intact. In particular, in a nonequivalent control group design there is a random assignment of intact groups to treatments, not random assignment of individuals.

Participants

A total of 25 girls from a suburban, predominantly African-American school were surveyed regarding their views on science. Participants in this study were seventh grade students at a suburban middle school based in Baltimore County, Maryland. (All participant names and the school's name will remain confidential). One survey was given to a co-educational section science class. A single-sex class was formed to develop self-esteem and to increase awareness and interest in science programs. Of the 25 participants, 17 girls came from the single-sex class and eight came from the coeducational class. Students who brought back signed permission slips were allowed to participate in the study. Two students were absent for various reasons during the administering of the survey. Participants from the single-sex class, included two Caucasian and 15 African-American students and had a cumulative grade point average of 2.7. The participants from the co-educational section were two Caucasian and six African-American students and had a cumulative grade point average of 2.9.

Before participants were found, the study was approved by the school principal. Next a permission letter was sent to parents. The parents were told that it was a survey on girls' opinion in science. Once the permission was granted then the GPA's were calculated for those students participating in the study.

Materials

A questionnaire was developed (Appendix A). The questionnaire was divided into three areas: Present, Past, and Opinion. Each section consisted of five questions that were based on a scale from 1-5, 1 = strongly disagree and 5 = strongly agree.

Procedure

The survey was administered during two class periods. One survey was given to a coeducational section science class and the other survey was given to a single-sex female class. The survey was administered during the last fifteen minutes of instruction time. After the questionnaire was answered each person's composite score was calculated and categorized according to female present (FEMP) versus coeducation present (COEDP), female future (FEMF) versus coeducation future (COEDF) and female opinion (FEMO) versus coeducation opinion (COEDO).

CHAPTER FOUR

RESULTS

The major findings showed that a comparison of the grade point averages of the two classes was not significantly different $t(10) = 0.245, p > .05$, with the means of the coeducational class being slightly higher than the females only class (2.935 versus2.744).

Table 1. GPA comparisons between female-only class and coeducational class

	FEMGPA	COEDGPA
Number of cases	16	11
Range	1.572	1.428
Mean	2.744	2.935
Standard Deviation	0.449	0.449

None of the other six *t* test comparisons between the female group versus the coeducational group in the three categories (present, future, opinion) of survey questions was significant.

Correlations between the above factors were significant for the following relationships: FEMP and FEMF, $r(15) = .725, p < .001$, FEMF and FEMO, $r(15) = -.465, p < .061$, COEDP and COEDF, $r(6) = .701, p < .053$. Within the three categories of the female class, significance was evident between present and future questions, $t(16) = 5.294, p < .000$, present and opinion questions, $t(16) = 8.706, p < .000$; and future and opinion questions $t(16) = 3.412, p < .000$. The coeducational class showed a significant difference within class: (a) There was marginal significance difference between present and future questions, $t(7) = 2.750, p < .088$; and (b) there was significant difference

between present and opinion questions, $t(7) = 2.486$, $p<0.042$; (c) there was no significant difference between future and opinion questions, $t(16) = 1.134$, $p<0.294$.

Table 2. Survey of Female and Coeducational Class P,F,O

	FEMP[a]	FEMF[b]	FEMO[c]	COEDP[d]	COEDF[e]	COEDO[f]
No. of cases	17	17	17	8	8	8
Minimum	7.000	5.000	5.000	7.000	5.000	5.000
Maximum	25.000	19.000	10.000	21.000	20.000	13.000
Range	18.000	14.000	5.000	14.000	15.000	13.000
Mean	15.353	10.059	6.647	12.625	9.875	7.250
Standard Deviation	4.676	3.716	1.730	4.838	5.249	2.816

Note: FEMP[a]= female present; FEMF[b] = female future; FEMO[c] = female opinion

COEDP[d] = Coeducational class present; COEDF[e]= Coeducational class future; COEDO[f] = Coeducational class opinion.

CHAPTER FIVE

DISCUSSION

The null hypothesis that there would be no significant differences between the all-female class and the coeducational class was partially confirmed. To explain, there were no significant differences between the two classes on GPA and present (P), future (F), or opinion (O) questions. On the other hand, the lack of correlations between the answers of the two classes on all of the questions suggests that there are differences in way they presently think about science, their future in science, and their opinions on science.

The highly significant differences between the survey categories of present, future, and opinion appears to support the statement that the categories are measuring independent thoughts. For example, for the female only class, the statements indicate significant differences between the scores of present and future categories. The difference between present and future showing lower scores in the latter also seems to indicate that the students do not feel that they have a substantial future role in science. This statement seems to apply with equal force to the coeducational class; that is, their present opinions are not necessarily what they see for themselves in the future. Although the difference between the present and future comparison and the future and opinion comparisons for the coeds are not significant, it may be due to the fact that only eight students were involved. In other words, a larger number of students could have turned both of their comparisons into significant differences.

Research has shown that single-sex classes do not show many differences in achievement (Sanders & Peterson, 1999). Usually girls who are already motivated by pre-existing conditions, such as higher aspirations, parental support, greater interest in

mathematics and higher education level of parents, all influence later achievement. Title IX restrictions also make teaching single-sex classes in coeducational schools difficult. Instead of having single-sex classes, schools should have staff development in gender equity. Some of the interventions that could help girls in learning include working closely with teachers, parents, and students about important roles that women play in the future, leading and supporting teachers in using gender equity principles in their classrooms and educating parents to encourage their daughters to encourage math and science (Sanders & Peterson , 1999).

Overall, while grade point averages do not seem to be directly influenced, a possibility exists that, if there were more students in the coeducational class, then the GPA of that class could be significantly higher. Further research on this point is recommended, for if the difference is true and continues to favor the coeducational class, then a performance difference could not be used to justify having an all female class.

A possible confounding variable may be the order in which the questions were asked: present, future, and opinion. The answers may have been different if the statements were block randomized; for example, instead of beginning with present category, begin with the future category.

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Appendix

Science Career Choices. Read each statement and rate according to your beliefs. 1 = strongly disagree, 2 = moderate disagree, 3 = agree, 4 = moderately agree, 5 = strongly agree.

Present

_____ 1. Science is my favorite subject in school.
_____ 2. I have always had an interest in science.
_____3. Biology is an easy subject.
_____4. I like to observe plant growth.
_____5. I like to conduct labs.

Future

_____1. I see myself as an astronaut.
_____2. I see myself as a biologist when I am older.
_____3. I see myself developing the cure to breast cancer.
_____4. I see myself as a nurse.
_____5. I see myself continuing to take science courses.

Opinion

_____1. Science should be a male dominated field.
_____2. Heart surgeons should be males.
_____3. Nurses should be women.
_____4. A housewife is a better choice for a woman than a scientist.
_____5. A teacher is a better choice for a woman than a scientist.