



***Gender Differences in
School Course Preferences***

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Introduction

Although there has been a difference between boys' and girls' enrollment and achievement in school subjects in the past, the difference was not significant. This has been demonstrated in the studies of achievement by the National Assessment of Educational Progress (NAEP), which have shown that only a slightly smaller percentage of males than females enrolled in Advanced Placement or Honors Chemistry and Physics. In addition, there was a slightly higher percentage of females who enrolled in Advanced Placement or Honors Biology than males. The percent differences in enrollment in these subjects were all 15% or under, except for enrollments in Physics and Advanced Placement Physics, which had 18% and 41% higher enrollments for males, respectively.

Another NAEP study reflects the declining gap in course enrollment. Although differences in scores are decreasing overall, they do increase as the students get older. According to 1989-90 NAEP data, the average proficiency for males in science was 10.2 points higher than for females at age 17. In mathematics, the average proficiency for males was 3.4 points higher than for females at the same age.

There has also been an increase in the enrollment of females in college preparatory courses (Danenberg, 2001). Six percent more girls than boys are now taking college-preparatory Math courses, seven percent more girls than boys are taking Physical Science, and 16 percent more girls than boys are taking Life Science. This study also shows girls as being enrolled at lower rates in Advanced Placement Physics, Calculus, and Chemistry courses. The widest gap found between male and female enrollment has been in Computer Science; there are 43 percent fewer girls in college-preparatory classes, and 72 percent fewer in Advanced Placement courses in this subject area.

SAT scores have shown little difference in achievement between males and females. From 1966 to 2003, males scored only slightly higher than females on the SATs in both the verbal and mathematics categories, as well as on their overall scores. The difference between the males' and females' math scores decreased over time, while the verbal difference increased from 1966 to 2003. In 1966, on average there was only a 5 point higher female verbal score than male verbal score, while the math difference was greater, with an average 40 point difference favoring the males. In 2003, on average there was an 8 point difference in verbal scores between males and females favoring the males, while the math score was on average 36 points higher for males.

Regardless of data reflecting only minimal differences in courses taken between males and females, the study "The Participation and Achievement of Girls in Mathematics and Science" shows that there are still significant discrepancies in the scores of males and females in mathematics and science assessments at the secondary level for college bound populations. For example, on College Board Achievement tests, males consistently average higher scores in all mathematics and science related subject areas. In addition, on the 1991 Advanced Placement Examinations, the average scores of males exceeded those of females in Calculus AB/ BC, Biology, Chemistry, Physics, and Computer Science.

There have been many speculations as to why this difference in gender motivation, enrollment, and achievement in school exists. One possible reason that has been found to explain this phenomenon is the enforcement of gender stereotypes of encouraging males toward math and science courses and females toward English and

social studies courses by parents, teachers, and other authority figures. In addition, other theories have concluded that females dislike taking more challenging subjects such as math and science because it is more difficult to perform at high levels of achievement in math and science courses and, therefore, they can be responsible for lower levels of self-esteem in students.

The purpose of this study was to determine whether there are significant differences in gender attitudes towards school subjects. A surveying method will be used, in which students will rate the high school courses on a Likert-like scale of 1 to 5, 1 being the lowest possible rating and 5 being the highest possible rating. Based on the findings of previous studies, my hypothesis is that there will be a slight but not significant difference between male and female preferences in school subjects in Tappan Zee High School. Males will rate their math and science courses higher than females, and females will rate their English and social studies courses higher than males, however, the percent differences between them will not be large enough to be considered significant.

Method

Participants:

Participants were students in Tappan Zee High School, a public school in suburban Orangeburg, New York. Tenth, eleventh, and twelfth graders were selected for this study because ninth graders had not taken an entire year's worth of each course and therefore could not properly assess their preferences or lack thereof for the individual subjects. A student permission slip to participate in the survey was mailed out to every student's home before the surveys were distributed. In total, there were 328 students surveyed, 190 tenth graders (85 males, 105 females), 92 eleventh graders (37 males, 55 females), and 46 twelfth graders (28 males, 18 females). The surveys were distributed to all of the English teachers to hand out to their tenth, eleventh, and twelfth grade classes.

Instrumentation and Procedure:

Quantitative research techniques were used in this study. Initially, the Science Research course students in the school were surveyed in order to gauge how accurately the survey would estimate students' course preferences. This was completed after receiving parental permission from the students' parents via a permission letter home. The data was gathered from a 124 question survey distributed to each student for 10 to 15 minutes in his or her English class. The survey included a 5 point Likert type scale on which the students indicated their preferences for each high school course they had completed or were taking. The survey included instructions for the students to indicate their preferences based on their attitudes toward the specific subject matter of each course and to not let other factors influence their choices. The "questions" included marking the students' age, grade and gender, and the score they gave to each of their courses. These scores, which were on a scale of 1 to 5, 1 being lowest and 5 being the highest, were indicated anonymously on a Scantron. To gather the data, the Scantrons were run through a Scantron machine, which marks the answers that are wrong according to a key. On the Scantrons, A meant choice 1, B meant choice 2, C meant choice 3, D meant choice 4, and E meant choice 5. Therefore, 5 keys of all As, Bs, Cs, Ds, and Es were utilized, and the number of wrong answers were subtracted from the number of right answers to show how many students answered each choice for each question.

Results

To analyze the full-school data, the average choices for each grade and gender were used. The average choices for tenth, eleventh, and twelfth grade males and females for each course were all derived, as well as overall male and female averages for each course, and finally male and female scores for the subject areas of Math, Science, English, History, Music, Foreign Language, and Physical Education. Not every student rated every course, and not every course had any rating at all. The mean ratings by males were slightly higher in all subjects except English. The average rating by males in Math out of 5 was 3.42, compared to the females' average rating of 2.89. In Science, the males on average rated their courses 3.60, while the females averaged 3.17. Females rated English an average 3.29, while the males averaged 3.08. Males rated their History courses slightly higher than females with an average rating of 3.46, compared to the females' average rating of 3.02. Foreign Languages were rated slightly higher by males with a 3.74, versus a 3.43. Males also rated their Physical Education courses considerably higher with an average rating of 3.40, while the females averagely rated 2.74 for Physical Education. There was very little difference in average rating for Music courses between males and females, however, with the males averaging 4.04 and females averaging 3.97.

The percent differences between the male and female course preferences were larger for males in all subjects except English and Social Studies. None of the percent differences were large, with Science having a 12 percent difference between male and female ratings, Math having a 15 percent difference, English having a 12 percent difference, Social Studies having a 13 percent difference, Foreign Language having an 8 percent difference, Physical Education having a 19 percent difference, and Music having a 2 percent difference.

Comparing the 10th, 11th, and 12th grade results, males in 10th grade preferred English more than females, averaging .28 higher ratings, but in 11th and 12th grades females preferred English more than males, averaging .55 higher ratings for 11th graders and .32 higher ratings for 12th graders. In Science, 10th and 12th grade males both rated their courses significantly higher than females, averaging .75 and .54 higher, respectively. However, 11th grade females rated their Science courses slightly higher than males. 10th, 11th, and 12th grade males all consistently rated their Math courses higher than females. 10th grade males rated their Social Studies classes .75 points higher than females did, however 11th and 12th grade females respectively rated their Social Studies classes 1.08 and 1.01 higher than males.

	12th Grade Females	12th Grade Males	11th Grade Females	11th Grade Males	10th Grade Females	10th Grade Boys
	Specific Course Average					
English 9R	3.13	3.125	3.83	3.32	3.62	3.12
English 9R Writing Lab	2.5	3	3	3.5	3.11	3.34
English 9H	2.67	3.5	4.29	3.33	4.44	3.45
English 10H	3.22	3.25	4.14	3.75	4.11	3.68

Computer Math/Basic		3.67				
Computer Math/JAVA		3.8				
Calculus	3.17	4				
AP Calculus AB	2.89	4				
AP Calculus BC	4	4				
AP Statistics	3	4.5				
Living Environment	2.89	3.09	3.61		3.79	3.84
Regents Earth Science	3.13	3.75	3.88	3.43	2.84	3.65
Active Physics	4.5	3.67		5	3.38	
Regents Chemistry	2.54	3.33	3.42	3.32	2.76	3.64
General Chemistry						
Bioethics	1.75	3.33	2.76	2.29	3	
Forensic Science	4	4	4.75	4.33	4	
Astronomy	4	3.5	3.4	4.33	2	
AP Biology	4.5	4.5		2		
AP Physics C	1.67	3.5	2.92	3.13	1	
AP Physics B		3.44	1.88	2.8		
AP Chemistry	3	4.17				
Science Research		4	4.5	3	2	
Spanish 1		4.33	2.33	2.67	3	2.98
Spanish 2	3.1	2.67	3.89	3.27	3.13	3.04
Spanish 3	3.43	2.73	3.9	3.31	3.18	3.02
Advanced Spanish 1	3.57	2.53	3.73	3.22	3.31	2.76
Advanced Spanish 2	3	3.25	3	3.25	4	
AP Spanish 1	4.4	3	5		1	
AP Spanish 2		3.5		4.5	1	
French 2		3			2	
French 3	3	5	4.5	4.75	3.95	4.2
French 4	3	5	4.69	4.25	4	3.9
French 5	3	5	4.92	4.25	2.67	
Italian 2	3	4.5		4	4.67	
Italian 3	4.5	4.17	3.63	3.5	3.62	3.42
Italian 4	4.5	3.5	3.54	3.67	3.6	3.7
Italian 5	5	3.4	3.54	4	2	
Eng. Drawing 1	5	5			4	
Eng. Drawing 2		4.25	5	4.8		4.2
Design & Drawing for Production		4.25	5	4.67	2	4.32
Architect Drawing		4.14	4.5	4.67	3	
Computer Ass't'd Design/Drafting		3.88	4	4.5	3.5	
Prin. Of Engineering		3.67	5	4.83	1	4.1
Photo/Video		4	5	4.67	1	
Studio in Art	4	3	3.6	3.57	3.58	3.4
Creative Crafts	3.29	3.67	4.58	4	4.03	3.6
Adv. Creative Crafts	3.14		4.39	4.67	4.29	4.1
Drawing and Painting	4.4		4.57		4.43	
Adv. Drawing	3.33	3.5	3.9	4.5	3.88	3.89
Adv. Painting	3.67	4	5	5	4.18	
Studio in Media Arts	4	3	3.67	5	4.24	
Fashion Design	2.75	3.75	3.92	3.4	3.45	
Computer Graphics	3		3.8	5	2.5	

English 10R	2.95	3	3.5	2	1	3
English 10R Writing Lab	3.75	3	3.59	3.1	3.56	3.21
English 11H	3.6	3.11	4.17	3.5	3.33	
English 11R	3.12	1		5	4	
English 11R Writing Lab	3.75	3.6	4.26	3.77	1	
English 12R	3.88	3.08	5	3	4	
English 12H World Literature	4.5	3.91			1	
Senior Seminar-Spring Writers Workshop	5	3	3.8	2.5	1	
Creative Writing	5		4.33		1	
Public Speaking						
Law and Literature	4	4	4.75	3	3	
Journalism	5	3.5	4	5	3	
American Popular Culture	3.11	2.23			2	
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Shakespeare Today						
Oh the Horror!	3.07	2.89	2	2	3	
Biblical Beings						
Music: The American Artifact						
Sitcoms	3.94	3.06	5	2	3	
The Lure of Magical Realism	4					
AP English	4					
World History 9R	3.11	3.48	3.84	3.84	2.93	1.47
World History 10R	3.5	3.1	3.71	3.1	3.47	2.96
World History 10H	3.89	3.71	4.09	4.14	4.21	3.2
US History/Government R	3	2.89	2.33	3.5	1	
US History/Government H	4	4.36	3.5	3.6	1	
Economics	2.46	2.86	4	4	1	
Issues in American Society	3	3.09	4	4	2	
Criminal Justice		4			3	
AP US History/Government	2.5	3.57	4.39	4.13	2	
AP World History	3	3.56	4.56	4.19	4.05	3.97
AP Psychology	4.14	3.17		4.5	1	
AP Economics	1.5	2.18			2.5	
Math A	1.83	3.06	2.92	3.44	3.2	3.6
Math 1A	2.67	2	4	3.2	2.6	2.6
Math 2A	1.5	2.2	4	3.5	3.12	3.45
Math A/B	4.28	3.31	2.9	2.79	3.08	3.92
Math A/B H	2	4	3.07	3.08	4.13	4.25
Math 1B	2.2	2.94	2.75	2.8	2.73	2.86
Math 2B	1	3	2.67	4	3	4.3
Math B H	1.33	3	3	3	2	3
Math B		3.33	3.15	2.82	3.5	3.6
Pre-Calculus	2	3.57	4.04	3.72	3	
Pre-Calculus H	4	3.57	3.47	3.09	3	
Math 12	2	2.25	1			

AP Studio Art	3.67	3.75	3.88	2.88	3.67	
AP Art History	5	3	4.14		3	
Into to Occ. 1- Fall	2	3	4.4	2	2.25	
Intro to Occ. 2- Spring		4.25			3	
Accounting		3.5	4.5		5	
Sports & Entertainment Marketing	3	4		3.5	2.5	
Adv. Marketing		4	4	4.17	2.75	
Computer App. 1		5			2	
Computer App. 2	4	3.5	4.5	5	3	2.5
Mixed Chorus	4	3.5	4.5		1	3
Select Vocal Ensemble	2.4	3.5	3.6	2.67	2.54	3.1
Madrigals	3.33	4	4.29	4	3.79	4.2
Music Theory	5	4.5	5	4.33	3.5	
AP Music Theory- Spring	5	4	5	4	2.57	
Concert Choir	5	3.25	5	3.67	3.5	
Concert Band	5	4.5	4.2	4.5	3.67	4.3
Choral Conducting		4	4.33	4	4.5	4
Concert Orchestra	3	4.2	4	3.8	4.6	3.7
Applied Music			3	5	3.67	
Phys Ed 9/10	2.07	3.32	3.24	3.39	2.88	3.65
Phys Ed 11/12	2.14	2.95	3.24	3.29	2.83	3.78
Health	3.67	3.95	4.35	3.8	4.05	4.35

12th Grade Females 12th Grade Males 11th Grade Females 11th Grade Males 10th Grade Females 10th Grade Males

Subject Area Averages

English	3.37	3.05	3.98	3.43	3.02	3.30
Science	3.20	3.74	3.35	3.30	2.78	3.53
Math	2.52	3.34	3.08	3.22	3.03	3.51
Social Studies	4.12	3.11	3.98	2.90	2.29	3.04
Foreign Language	3.73	3.75	4.03	3.83	3.08	3.43
Music	4.10	3.99	4.27	4.00	3.59	3.86
Gym	2.63	3.41	3.61	3.49	3.25	3.93

Females Males
Specific Course Average

English 9R	3.53	3.19
English 9R Writing Lab	3.31	3.28
English 9H	3.8	3.43
English 10H	3.82	3.56
English 10R	2.48	2.67
English 10R Writing Lab	3.63	3.1
English 11H	3.7	3.31
English 11R	3.56	3
English 11R Writing Lab	3	3.69
English 12R	4.29	3.04
English 12H World Literature	2.75	2.46
Senior Seminar-Spring		
Writers Workshop	3.27	2.75
Creative Writing	3.44	
Public Speaking		
Law and Literature	3.92	3.5
Journalism	4	4.25
American Popular Culture	2.56	2.23
Shakespeare Today		
Oh the Horror!	2.69	2.45
Biblical Beings		
Music: The American Artifact		
Sitcoms	3.98	2.53
The Lure of Magical Realism	4	
AP English	4	
World History 9R	3.29	2.93
World History 10R	3.56	3.05
World History 10H	4.06	3.68
US History/Government R	2.11	3.2
US History/Government H	2.83	3.93
Economics	3.73	3.43
Issues in American Society	3	3.55
Criminal Justice	3	4
AP US History/Government	2.96	3.85
AP World History	3.13	3.91
AP Psychology	2.57	3.84
AP Economics	2	2.18

Math A	2.65	3.37
Math 1A	3.09	2.6
Math 2A	2.87	3.05
Math A/B	3.42	3.34
Math A/B H	3.07	3.78
Math 1B	2.56	2.87
Math 2B	2.22	3.77
Math B H	2.11	3
Math B	3.33	3.25
Pre-Calculus	3.01	3.65
Pre-Calculus H	3.49	3.33
Math 12	1.33	1.63
Computer Math/Basic		3.67
Computer		
Math/JAVA		3.8
Calculus	3.17	4
AP Calculus AB	2.89	4
AP Calculus BC	4	4
AP Statistics	3	4.5
Living Environment	3.43	3.44
Regents Earth		
Science	3.28	3.61
Active Physics	3.94	4.34
Regents Chemistry	2.91	3.43
General Chemistry		
Bioethics	2.5	2.81
Forensic Science	4.25	4.17
Astronomy	3.13	3.92
AP Biology	4.5	3.25
AP Physics C	1.86	3.32
AP Physics B	2.94	3.12
AP Chemistry	2.5	4.17
Science Research	3.25	3.5
Spanish 1	2.67	3.69
Spanish 2	3.73	2.99
Spanish 3	3.5	3.02
Advanced Spanish 1	3.54	2.84
Advanced Spanish 2	3.33	3.25
AP Spanish 1	3.47	3
AP Spanish 2	1	4
French 2	2	3
French 3	3.82	4.65
French 4	3.9	4.38
French 5	3.53	4.63
Italian 2	3.84	4.25
Italian 3	3.92	3.7
Italian 4	3.88	3.62

Italian 5	3.51	3.7
Eng. Drawing 1	4.5	5
Eng. Drawing 2	5	4.42
Design & Drawing for Production	3.5	4.46
Architect Drawing	2.5	4.41
Computer Asst'd Design/Drafting	3.75	4.19
Prin. Of Engineering	3	4.2
Photo/Video	3	4.34
Studio in Art	3.73	3.32
Creative Crafts	3.97	3.76
Adv. Creative Crafts	3.94	4.39
Drawing and Painting	4.47	
Adv. Drawing	3.7	3.96
Adv. Painting	4.28	4.5
Studio in Media Arts	3.97	4
Fashion Design	3.37	3.58
Computer Graphics	3.1	3.15
AP Studio Art	3.74	3.32
AP Art History	4.05	3
Into to Occ. 1- Fall	2.88	2.5
Intro to Occ. 2- Spring	3	4.25
Accounting	4.75	3.5
Sports & Entertainment Marketing	2.75	3.75
Adv. Marketing	3.38	4.09
Computer App. 1	2	5
Computer App. 2	3.83	3.67
Mixed Chorus	3.17	3.25
Select Vocal Ensemble	2.85	3.09
Madrigals	3.8	4.07
Music Theory	4.5	4.42
AP Music Theory- Spring	4.19	4
Concert Choir	4.5	3.46
Concert Band	4.29	4.43
Choral Conducting	4.42	4
Concert Orchestra	3.87	3.9
Applied Music	3.33	5
Phys Ed 9/10	2.73	3.45
Phys Ed 11/12	2.74	3.34
Health	4.02	4.03

	Girls	Boys
	Subject Area Average	
English	3.4865	3.084706
History	3.02	3.4625
Math	2.888125	3.422778
Science	3.12307692	3.597692
Foreign Language	3.43133333	3.735333
Music	3.97222222	4.041111
Gym	2.735	3.395

Percent Differences
Course

Science	12%	higher boys preferences
Math	15%	higher boys preferences
English	12%	higher girls preferences
Social Studies	13%	higher girls preferences
Language	8%	higher boys preferences
Gym	19%	higher boys preferences
Music	2%	higher boys preferences

	12th Grade Girls	12th Grade Boys	11th Grade Girls	11th Grade Boys	10th Grade Girls	10th Grade Boys
	Subject Area Averages					
English	3.37	3.05	3.98	3.43	3.02	3.30
Science	3.20	3.74	3.35	3.30	2.78	3.53
Math	2.52	3.34	3.08	3.22	3.03	3.51
Social Studies	4.12	3.11	3.98	2.90	2.29	3.04
Foreign Language	3.73	3.75	4.03	3.83	3.08	3.43
Music	4.10	3.99	4.27	4.00	3.59	3.86
Gym	2.63	3.41	3.61	3.49	3.25	3.93

Discussion

Generally, males had more positive attitudes toward school subjects than females. In all subject areas excluding English, males rated their courses higher than females did. This may be an indication that males overall enjoy school more than females do.

Similarly to national results on gender enrollment and preferences in school subjects, the differences in gender preferences at Tappan Zee were not highly significant. However, Tappan Zee's overall percent differences were higher than the national averages, with males preferring their Math and Science courses more than females exhibiting a 15 percent difference in Math ratings and 12 percent difference in Science, while females preferred their English courses more than males, revealing a 12 percent difference in the genders' ratings.

Tappan Zee's gender course preferences also demonstrated trends parallel to that of the national enrollment data in the 1994 NAEP study. Similar to the very small percent differences between the national enrollments of males and females in lower level Mathematics and Science courses, Tappan Zee males preferred their lower level courses only slightly more than females, and in some cases, females either preferred these courses equal to or slightly more than the males did. The difference between Tappan Zee gender preference ratings in Advanced Placement or Honors Mathematics and Science courses increased from that of lower level courses, with males' ratings becoming increasingly higher than females in all advanced Science and Mathematics courses. In Advanced Placement Chemistry, Advanced Placement Physics B, and Advanced Placement Physics C, on average, males rated the courses 40%, 6%, and 44% higher than females did, respectively. The only exception in the Science ratings was in Advanced Placement Biology, which the females on average rated 28% higher than the males. These trends correlated with the national data in the NAEP enrollment study, including the exception in Advanced Placement Biology ratings.

The higher scores for males on SAT scores may show a link between the differing genders' achievements in math and verbal and their preferences for courses that feature aspects of the mathematics and verbal sections. The theory that one's success in a course influences his attitude toward that subject may provide an explanation for this phenomenon. The smaller difference in males' and females' scores in verbal scores than math scores may influence females' preferences for verbal-related subjects such as English, while males' higher achievements in the math portions of the test may influence their favorable attitudes toward Mathematics, as well as math-related sciences such as Chemistry and Physics.

This theory also holds true for the College Achievement tests being studied. The males' consistently higher scores over females in the Mathematics and Science Advanced Placement tests could show the lowering of females' self-esteem due to lower scores on their less notable achievements in those areas. Their lessened self-esteem could greatly influence the females' attitudes and preferences toward school subjects, and therefore could negatively affect their enrollment in these courses.

This research is meaningful in many ways. On the basis of the results obtained in this study, specific recommendations can be made concerning females' attitudes and preferences toward Math and Science courses. Parents and teachers should be encouraged to avoid stereotypical gender-based attitudes toward school subjects and to

support females' participation in Math and Science courses through discussions, school activities, female guest speakers, and field trips to laboratories and businesses which employ female Math and Science graduates. By encouraging and improving female students' attitudes toward Math and Science courses, teachers and administrators may facilitate more positive attitudes by females toward these subject areas. This research can also be used by teachers and school administrators to gain more insight into differences between male and female psyches, namely, understanding of general differences in males' and females' mental attitudes, emotions, self-motivation, and self-esteem. In addition, school districts can use this research to determine methods to encourage more female enrollment in Advanced Placement Science and Mathematics courses and to assist females in gaining higher achievement in Science and Math courses. Furthermore, school administrators can also be encouraged to pursue more nontraditional recruitment, such as more female instructors for Math and Science courses and more males for English and Social Studies courses.

Review of Literature

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