TEACHER-FACILITATOR MATERIALS FOR CORNELL INSTITUTE FOR WOMEN IN SCIENCE VIDEO SERIES

FOSTERING INTEREST IN MATH AND SCIENCE AMONG YOUTH, PART 1

When it comes to math and science, in some ways females are doing very well. They take as many math and science courses and they get better grades than males—and this continues throughout college. They also major in mathematics nearly as often as males (46% of math majors are females), the receive roughly half of the PhDs in biology, half the MDs in medicine, and dominate other fields (e.g., psychology, veterinary science), and they have narrowed the gaps separating them from males among the elite performers (e.g., among the highest scorers on the SAT-Math test). In short, females have made tremendous progress over the past few decades. It is common now to read stories about males are in need of intervention, as they get lower grades, drop out more often, matriculate in college less often, have higher incidence of all sorts of mental and physical ailments.

And yet amidst this rosy picture of females there are signs that not all is well. Girls continue to report negative stereotypes about their math ability and this is correlated with poorer performance on math and science tests as well as with their liking of math and science. Consider the findings in the table below by Brown and Leaper.

The table shows that among Latinas and European American females, the perception of sexist remarks about girls not being good at math in high school resulted in a decrease in their perceived competence, from 9.04 for girls who did not perceive sexist comments down to 8.25 for those who perceived multiple instances of sexist remarks. Although you might wonder if the sexist comments were valid (i.e., girls who were actually poorer at math were the recipients of sexist comments), the authors controlled math grades. In other words, the reduction in perceived math competence was found for girls with very high math scores as well as those with low scores. Sexist comments are damaging not only to perceived competence but to "liking" of math and science; girls who are victims of sexist comments decrease their liking of these subjects and end up taking courses

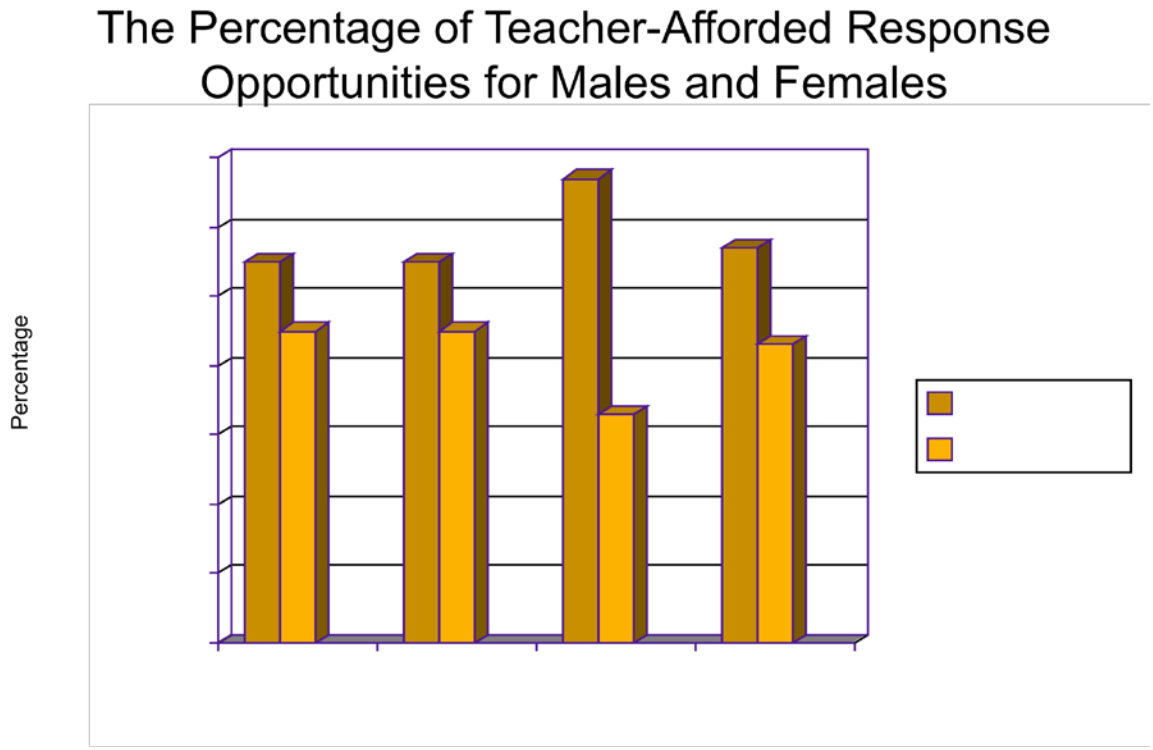
An interesting aspect of this table is that younger girls did not display the same decrease in their perceived math competence when they overheard sexist remarks. In fact, some actually exhibited an increase in their competence when they were victims of sexist comments! This suggests that over time, with repeated experience with sexist remarks, girls reduce their perceived competence. Perhaps if we had data on college-aged females we'd see a further increase in the damaging effect. Clearly, this is something that schools can and should do something about.

In the figure below we see another seeming source of sex differences that might impact girls math performance. This graph shows that math teachers call on boys more than they call on girls. Perhaps, some have argued, this differential attention sends girls a message that the teacher thinks more highly of boys' ability. However, before leaping to this conclusion, consider other possibilities: Teachers may call on boys more as part of a tactic to control their boisterous behavior in class. We cannot tell from these data which explanation is valid. But one thing we do know is that even if teachers are giving more

positive attention to boys in their classes, girls are still managing to win the grades race. They get better grades in math than boys, as noted above.

Recommended Reading:

Brown, C.S. & Leaper, C. (2010). Latina and European American Girls' Experiences with Academic Sexism and their Self-Concepts in Mathematics and Science During Adolescence *Sex Roles, 63*, 860-870.



*
Direct Question refers to a time when a teacher directly calls on a student by name.

Open Question refers to a question addressed to the whole class and then the teacher calls on a student who has his or her hand raised

Call-Outs: When a student calls out an answer and the teacher directs the attention of the class to that particular student.

Source:*Becker, J. R. (1981). Differential treatment of females and males in mathematics classes. Journal for Research in Mathematics Education 12*(1): 40-53.

Perceived Competence in Math and Science with Math Grades Controlled (Brown & Leaper, 2010)

Age and ethnicity	Perceptions of academic sexism		
	None	A few times	More than a few times
Younger (ages 13–15)			
Latina, n=119	8.44 (.17)[a] n=54	8.24 (.20)[b] n=36	8.19 (.23)[b] n=29
European American, n=65	8.95 (.24)[a] n=29	8.92 (.28)[a] n=23	9.67 (.34)[a] n=13
Combined, n=184	8.70 (.15)[a] n=83	8.58 (.17)[a] n=59	8.93 (.20)[a] n=42
Older (ages 16–18)			
Latina, n=134	8.34 (.16)[a] n=63	8.63 (.21)[a] n=35	7.79 (.21)[b] n=36
European American, n=27	9.73 (.39)[a] n=11	8.10 (.43)[b] n=9	8.71 (.48)[b] n=7
Combined, n=161	9.04 (.21)[a] n=74	8.37 (.24)[a] n=44	8.25 (.26)[b] n=43
Combined ages			
Latina, n=253	8.39 (.11)[a] n=117	8.44 (.15)[a] n=71	7.99 (.16)[b] n=65
European American, n=92	9.34 (.24)[a] n=40	8.51 (.26)[a] n=32	9.19 (.30)[a] n=20