

# **Gender Differences and Instructional Discrimination in the Classroom**

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Sharlene George had done exceptionally well in school. She had straight A's, had 99th percentiles on her GRE, and had published as an undergraduate. She applied to several graduate science programs, among them Stanford. At the culmination of her interview there she was interrogated by the head of the department, who was at the moment a "famous man." "Miss George, do you know why I'm interviewing you?" Sharlene replied that she presumed it was because her records were superlative and she was so clearly a fine candidate for graduate school. "No," the star said. "That's not why at all. It's because this year (it was 1967, the height of the Vietnam War) I'm reduced to the lame, the halt, the blind and the women" (Gornick, 1990, pp. 96-7).

While many occupational barriers have fallen, the US. work force is still almost entirely sex-segregated. Women are clustered primarily in low-status and low-paying clerical, retail sales, and service jobs often termed the "pink-collar ghetto" (Ehrhart & Sandler, 1987). Women are underrepresented at the other end of the occupation spectrum. At least 75% of the jobs in the higher paying professions are held by men (Bureau of the Census, 1984). The percentages of women in nontraditional fields have increased but often this has occurred in lower level positions within a category (Bureau of the Census, 1984). For instance, about 60% of white males but only 17% of white females work in what the Census Bureau terms "professional and technical" jobs. This 17%, however, work primarily in only five of the fifty jobs that comprise the "professional and technical" category.

A majority of females have not elected to pursue careers in science oriented professions (National Science Foundation, 1988). By the time they are sophomores, only 10% of the girls compared with 25% of the boys express interest in the natural science. By the end of high school, about one-fifth of the boys but only one-twentieth of the girls continue to indicate a potential career interest in these fields (Shakhashiri, 1990). In academia, women are underrepresented on both science and mathematics faculties, even in relation to the number of women trained in graduate programs (Koshland, 1988, Oakes, 1990). Among academic scientists, men are far more likely than women to hold tenure track positions, to be promoted to tenure, and to achieve full professorships (National Science Board (NSB), 1987). This is true even when analysts control for factors such as field of specialization, quality of graduate

school attended, and years of experience beyond their doctoral degrees (NSB, 1987). Women are also underrepresented in the science, mathematics, and technology work force. Women scientists are underutilized in the work force compared to their male counterparts. Among scientifically trained women in 1986, 25% of the women, compared with 14% of the men, were employed in work unrelated to science (National Science Foundation, 1988).

One way to decrease these discrepancies is via education and teacher encouragement to enter in the highly paid and often prestigious professional fields including science, engineering, law, computer science and technical fields, medicine, and mathematics. To accomplish this, many educators need to examine and modify their current classroom practices.

### **Disinviting Behaviors of Teachers**

Many of us, as faculty members, treat men and women differently. Faculty members may communicate limiting preconceptions about appropriate and expected behavior, abilities, career directions and personal goals which are based on sex rather than on individual interest and ability (Hall and Sandler, 1982). Faculty members of both sexes may ask questions and look at men students only for response (Thome, 1979). Some faculty tend to ask women lower order factual questions while reserving higher order critical thinking questions for men (Sadker & Sadker, 1982). Some professors interrupt women students more often than men students or allow women to be easily interrupted by others during class discussions (Hall & Sandler, 1982) while praising female students for being polite and waiting their turn (Eccles & Jacobs, 1986). In addition to the subtle forms of discrimination enumerated above, more overt behaviors discourage female students. These may entail disparaging comments about women as a group and the use of sexist humor or demeaning sexual allusion (Hall & Sandler, 1982).

Discriminatory teacher behavior does not begin in the college classroom but rather with the advent of schooling. Most K-8 teachers, almost all women, suffer from inadequate preparation in science so that they fear teaching science and lack confidence in their ability to do so (Weiss, 1989). These teachers model for females a fear of or feeling of helplessness with science or mathematics thereby saying to them that it is natural for them not to like or be good at these subjects (Vetter, 1992).

Research from the past twenty years consistently reveals that males receive more teacher attention than do females (Brophy & Good, 1974; Jones, 1989; Lockheed, 1984; Lockheed & Harris, 1989; Sadker & Sadker, 1986b; Spaulding, 1963). The pattern begins in preschool with teachers conferring more attention, more instructional time and more hugs to male students and persists through the twelfth grade (Ebbeck, 1984). According to Ebbeck (1984) this pattern occurs, in

part, because males exact more attention from teachers by calling out answers eight times more often than females in the elementary and middle grades. Teachers typically listen to boys' comments when they call out but girls are usually corrected (Sadker, Sadker, & Thomas, 1981). Sadker & Sadker (1985) found that even when boys do not proffer answers, teachers are more likely to request responses from them.

The quality of teacher contacts varies between the genders. Boys receive more teacher reactions of praise, criticism and remediation (Sadker & Sadker, 1986a). Baker (1986) reported that in secondary science classrooms more precise teacher comments were rendered to males than to females in terms of both scholarship and conduct.

Most studies on the interaction between teachers and students do not differentiate among subject areas. However, Kahle (1990) has recently documented that teacher student interactions in science classes are particularly biased in favor of boys.

Research has demonstrated that, from preschool on, the activities chosen for classes appeal to boys' interests and the presentation formats selected are those in which boys excel or are encouraged more than are girls (Fennema & Peterson, 1987). Investigators have found that during lectures teachers ask males academically related questions about 80% more often than they question females. The patterns are mixed in laboratory classes (Baker, 1986). Science teaching at all levels, and increasingly from elementary to secondary levels, is dominated by textbooks, teacher lectures, workbook exercises, and writing answers to questions (Goodlad, 1984). These strategies generally focus on presenting knowledge and skills in isolation, rather than in the context of real life problem solving. Johnston and Aldridge (1984) suggested that the abstract character of instruction may be a fundamental problem in science and mathematics education. Women tend to have a greater interest in people than in things and respond more positively to ideas in context (field dependence) than in isolation (field independence) and would, therefore, respond more negatively than white males to the typical type of instruction found in science classrooms (Oakes, 1990).

There is also direct evidence that boys benefit from conventional teaching strategies (e.g., whole class instruction and competitive reward structures), and girls benefit from strategies using cooperative and hands on activities (Eccles, Maclver, &

Lange, 1986). Peterson and Fennema (1985) found that competitive classroom activities contributed to boys' mathematics achievement, but were detrimental to girls' achievement. In contrast, cooperative activities contributed to girls' acquisition of basic math topics and skills and to their achievement on high level

math tasks. These cooperative activities did not hinder boys' attitudes or achievement.

### **Limiting Preconceptions in Postsecondary Education**

Colleges and universities ideally provide an environment that differentiates between students on the basis of merit. The participants in the postsecondary institution are not exempt from the limiting preconceptions held by the larger society or from the everyday behaviors by which different perceptions of men and women are reinforced and expressed. Despite the increasing presence of women on campuses, college is still often considered a masculine endeavor and success is believed to be based on skills and abilities such as intellectual argumentation (Parker, 1973) and proficiency in mathematics, areas in which many persons believe females lack competence despite recent research to the contrary (Linn & Hyde, 1989). Academic work produced by men may be valued more highly than that of women. A female student may have to outperform her male peers to be taken seriously by her professors. This general tendency to devalue women and their work is illustrated by a series of related studies (Nieva & Gutek, 1980) in which two groups were asked to evaluate articles, paintings, resumes, and other similar products. The name on each item was clearly masculine or feminine. The sex of the originator of each item was switched for the second group of evaluators. Regardless of the type of item evaluated, those ascribed to a male were rated higher than those ascribed to a female. In all trials, female evaluators were as likely as male evaluators to downgrade those items ascribed to women.

Because many women may consciously or unconsciously share this circumscribed view of women's abilities, some female faculty (as well as some male faculty) may expect less of their women students. These narrow expectations may become self-fulfilling prophecies. As women move through their college careers they often have less confidence about their capacity to achieve academic and professional success. Research has indicated that female postsecondary students are more likely than male students to doubt their abilities and to attribute their success to luck or hard work rather than to skill (Erkut, 1979).

Following is a partial list of some of the behaviors faculty members exhibit that discourage participation by women (Hall & Sandler, 1984):

- calling on male students most of the time
- asking female students easy questions; asking male students more difficult
- questions that require higher order thinking

- looking at male students to answer questions before females (or males) even can raise their hands
- referring only to male contributions to science
- calling women by their first names; calling men "Mister"
- utilization of whole class lectures as the dominant teaching strategy the use of competitive reward structures
- presentation of abstract subject matter largely devoid of practical applications (e.g., abstract science "factoids" with no applications or relevance to society and its problems)

### **Inviting Female Participation**

Research shows that the students who participate actively in the classroom setting benefit the most from the instructional experience (Sandler and Hall, 1986). Following are some strategies faculty can use in all classes to encourage women to participate more in the classroom and to enhance their confidence in themselves and their abilities. The use of such strategies is especially critical in such male dominated areas as science:

- be aware of who you are looking at; make eye contact with all students
- ask questions that require higherorder thinking of both males and females (e.g., "What are the implications for evolutionary theory if the theory of punctuated equilibrium is correct?")
- increase "wait time," and endure the silence for a while; call on a student only when hands are raised from both genders
- use examples that include women as well as men
- call all students by name, using first names for all or use last names for all; do not use Ms. and Miss for females while using only Mister for men
- take a poll on a particular question; asking the class to vote encourages the sense of participation for all students
- eliminate sexist language and avoid using the generic "he" (e.g., use the plural "they")
- avoid sexist humor as a classroom device
- use "connected knowing" in classrooms which will allow girls to empathically enter into a subject they are studying; present knowledge and skills in the context of reallife problemsolving (e.g., textbooks usually present an adequate list of the steps in the scientific method as a list of rules but do not provide opportunities to actually apply these models for scientific inquiry)

- emphasize collaboration and reorganize the competitive structure of classrooms (e.g., use cooperative learning and hands-on activities in classes and eliminate or sharply decrease public criticism)
- emphasize the relevance of the content to real-life situations and endeavors intervene in communication patterns among students that may shut out women (e.g., male students interrupting female students in class discussions)
- avoid reference to female students' appearance without similar reference to male students' appearance

### Conclusion

Gender inequities exist from elementary to postsecondary classrooms. Most instructors are unaware that they treat women and men differently in the classroom and, when they become aware of the problem, they can change their behavior (Sadker and Sadker, 1986b).

Few teachers are intentionally disinviting to female students. Many, however, are unintentionally disinviting. According to Purkey (1992), people functioning at this level lack consistency in direction and purpose and so behave in disinviting ways. Those of us who function at this level need to evaluate our behavior and change it so that we reach out to our students with a summons to grow and develop all their talents physically, intellectually, and emotionally. Otherwise, women will continue to be excluded from full and fair participation in the educational process and we will perpetuate an educational system which pays only lip service to real equality.

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