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# Teacher-Student Interaction

## An Exploration of Gender Differences in Elementary Physical Education

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The effects of gender differences and gender bias within educational settings have long been researched (AAUW Report, 1992; Carelli, 1988; Coakley & White, 1992; Kahle, 1991; Knoppers, 1988; McBride, 1990; Sadker & Sadker, 1985; Thorne, 1992; Twarek, 1994). In physical education, teachers and coaches often discuss whether male and female students differ in how they think about and perform in sport and physical education, and, if so, whether these differences are a product of gender-biased educational settings. These are important issues, and physical education professionals need to take a second look at the research evidence in order to determine how far they have come and how far they have yet to go in developing equitable learning environments.

Gender bias can be a serious detriment to learning. Educators have a very powerful effect on their students' development of self-image, but this effect frequently differs between boys and girls. In some classrooms, female students can become nearly invisible, as teachers interact more frequently with boys, asking them better questions and providing more precise and helpful feedback (Sadker & Sadker, 1994). Some teachers believe that one sex has superior abilities in one or more areas, and promote this notion via their teaching behaviors. Such biased teacher behavior can contribute to students' insecurity about their abili-

ties and decrease their potential for achievement (Martinek & Karper, 1982; Martinek, Crowe, & Rejewski, 1982; Sadker & Sadker, 1994).

A teacher's gender bias is not the only gender-based factor that affects teacher-student interaction, though (Anderson & Adams, 1992). In such interactions, each person involved influences the other's behavior. It is possible that male and female students differ in how they seek information and help from a teacher. If these differences truly exist, physical educators who understand them could be better equipped to meet the learning needs of both genders. In addition, because students who frequently initiate teacher-student interactions are more likely to receive teacher-initiated attention (Anderson & Adams, 1992; Irvine, 1986), clarification of gender differences could help teachers train all of their students to efficiently access the information they need.

Results from past studies of gender bias in physical education seem to hint that these phenomena have diminished over time. Both Dunbar and O'Sullivan (1986) and Knoppers (1988) noted that teachers' instructional techniques and interactions with students tended to be laced with gender bias. McBride's (1990) more recent study, however, found no gender bias in teacher interactions with boys and girls, nor in students' perceptions about those interactions.

Similarly, Coakley & White (1992) interviewed ten- to 18-year-old male and female students who significantly differed in how they defined and interpreted sports experiences, and in how past physical education and school sport experiences influenced their subsequent sports participation. More recent studies, however, have failed to show evidence of significant gender differences in children's physical education activity levels (Sarkin, McKenzie, Thomas, & Sallis, 1997), in female participation, or in student perceptions about females in a sport education unit (Hastie, 1998). As with the studies that focused upon gender bias, one has to wonder whether gender differences in physical education learning and performance are diminishing.

A renewed interest in this research area could help to clarify whether these improvements are genuine and determine whether more can be done to create a truly equitable physical education environment. The issue is complicated by the wide variety of factors that affect teacher-student interaction in the physical education setting. However, a series of carefully constructed studies may help us accomplish our objectives. A logical first step is to examine the frequency with which teachers and students initiate interaction, in order to determine whether gender differences and gender bias still exist.

## Purpose and Method

The authors undertook a preliminary study to examine gender bias (represented by teacher-initiated interactions) and gender differences (represented by student-initiated interactions) as they relate to teacher-student interaction in a physical education class.

**Subjects.** A representative sample of fourth-grade elementary physical education classes at four suburban public elementary schools in north central Texas was identified for study participation. Participating fourth-grade students (N=84; 43 females and 41 males) included Euro-American (65 percent), Hispanic/Latino American (17 percent), African American (11 percent), and Asian American (7 percent) children.

The four participating physical education teachers (one African American male, one Euro-American male, two Euro-American females) met the selection criteria of having three or more years of elementary physical education teaching experience and had achieved a level of "Exceeds Expectations" for at least two consecutive years on the Texas Teacher Appraisal Instrument.

**Instruments.** The Teacher-Student Interaction (TSI) form (see figure 1) was used by researchers during videotaped observations to record (1) the frequencies of student- and teacher-initiated interactions, (2) to whom teacher-initiated interactions were di-

rected (to individual students, small groups, or the class as a whole), and (3) the nature of the teachers' instructional statements (general or specific feedback, positive or negative instructional feedback) (Logsdon et al., 1984; Rink, 1993).

**Procedures.** Over a four-month period, each physical education class was videotaped 12 times. Teachers conducted lessons involving ball-handling, hand-eye, and rhythmic activities. During each taping session, students wore identification numbers assigned by the teacher, taped or tied to the front and back of their shirts. Students whose parents did not grant permission for participation in the study did take part in class activities, but were eliminated from the data pool for analysis. Each teacher wore a microphone so that the nature of teacher-initiated statements could be recorded.

## Data Analysis

The objective was to determine whether levels of teacher-student interaction for boys and girls matched expected levels based on enrollment representations. To accomplish this, expected participation levels were calculated for each group based on percentages of group members enrolled in the class and the percentage of actually observed frequencies of teacher-initiated statements and student-initiated statements.

## Results

The researchers recorded 496 teacher-initiated statements (excluding statements made to the whole class) and 154 student-initiated statements. A classification of the statements by teacher and student genders appears in tables 1 and 2. Fewer statements than expected were both received and initiated by boys. More statements than expected were received and initiated by girls. In addition, male teachers initiated more statements to girls, whereas female teachers initiated a greater number of statements to boys.

## Conclusion

This preliminary study appears to contradict much of the earlier work of the 1980s (Carelli, 1988; Knoppers, 1988; Sadker & Sadker, 1985). However, it does coincide to a small degree with more recent work (Kahle, 1991; Martin, 1996; McBride, 1990). Over the past 20 years, research has indicated that boys have received more teacher attention than girls. This preliminary study appears to suggest that traditional attitudes toward both boys and girls in elementary physical education are shifting. The subjects in this study (both teachers and students) appeared to be exhibiting a more egalitarian view of their interactions. One particularly interesting finding is that the initiation of statements by girls to both male and fe-

Figure 1. Teacher-Student Interaction (TSI) Form

Figure 1. Teacher-Student Interaction (TSI) Form											
Interaction Initiator (✓) T=Teacher Initiated (✓) S=Student Initiated (Record ID #)		Teacher-Initiated Statements directed to... (✓) ID #=Individual student identification number B=Group of 2+ boys G=Group of 2+ girls M=Group of mixed gender C=Whole class				TIS Type (Type of Feedback) (✓) +GV=positive general input -GV=negative general input +SV=positive specific input -SV=negative specific input					
Segment #	Interaction Initiator		Teacher-Initiator Statements (TIS) directed to...				TIS Type (Feedback)				
	T	S	ID #	B	G	M	C	+GV	-GV	+SV	-SV
1											
2											
3											

**Table 1. Teacher-Initiated Statements to Students**

	Male Students		Female Students	
	N	Percent	N	Percent
Male Teachers	95 (130) <sup>a</sup>	33	188 (153)	66
Female Teachers	124 (112)	58	89 (100)	42

$\chi^2 = 4.83$  (df = 1); CV = 3.84 @ .05

<sup>a</sup>Numbers in parentheses are expected values

**Table 2. Student-Initiated Statements**

	Male Teachers		Female Teachers	
	N	Percent	N	Percent
Male Students	17 (29) <sup>a</sup>	28	43 (48)	72
Female Students	46 (34)	49	48 (43)	51

$\chi^2 = 5.8$  (df = 1); CV = 3.84 @ .05

<sup>a</sup>Numbers in parentheses are expected values

male teachers was greater than the proportional expectation. This suggests that female students did not perceive teacher bias in their physical education classes.

As we move into the 21st century, it may be that we are fostering more equitable teacher-student interactions. Further use of the techniques employed in this study to document frequency and type of feedback may help physical education researchers and professionals better understand gender biases and differences and substantiate recent findings. Continued exploration of teacher-student interactions will enable physical educators to provide high-quality programming for all students.

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