

# Opportunities to Participate and Teacher Interactions in Coed versus Single-Gender Physical Education Settings

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## Abstract

*The idea that single-gender physical education settings may result in a higher number of interactions with teachers and participation opportunities for female students has gained a considerable amount of attention in recent years. The purpose of this study was to compare high school aged females and males opportunities to participate and interact with teachers during flag football, soccer, and ultimate Frisbee game play in a coeducational and single-gender setting. Participants included 67 high school students enrolled in two intact physical education classes. Opportunities to participate for males and females were evaluated by recording frequency of touches during direct observation of game play. A modified version of a portion of the Observational Recording Record of Physical Educator's Teaching Behavior (Stewart, 1989) was used to monitor the type and rate of teacher/student verbal interactions. Results from this study suggest that female students in single gender physical education settings may receive more opportunities to participate during flag football, ultimate Frisbee, and soccer game play. Results also suggest that teachers tend to have a higher rate of verbal interaction with female students in single gender settings. More research is recommended to investigate the complex variables associated with coeducational and single gender physical education settings.*

## Introduction

Low levels of physical activity have been reported for a growing number of children and adolescents. This problem is most prevalent

among preadolescent and adolescent girls (Sallis, Prochaska, & Taylor, 2000). Sallis, McKenzie, Alcaraz, Kolody, Faucette, and Howell (1997) revealed that as early as 4th and 5th grade, girls had less baseline levels of physical activity than boys. As reported by Heath, Pratt, Warren, and Kann (1994), the United States National Risk Behavior Survey conducted in 1990 assessed more than 11,000 students in grades 9 through 12 on the criterion of vigorous activity for at least 20 minutes per day and a minimum of three days per week. Results showed that the proportion of girls who were active varied from 31% in 9th grade down to 17% in 12th grade. Bradley, McMurray, Harrell, and Deng (2000) reported beginning in the seventh and eighth grades, more than half of the girls reported mostly sedentary activities. This percent increased with each grade through high school. A study on middle school students' physical activity levels by McKenzie, Marshall, Sallis, and Conway (2000) found that boys engaged in more moderate to vigorous physical activity and expended more energy than girls. Boys were coded very active more than girls throughout the lesson time (17% vs. 12%), during skill drills (18.5 vs. 11.9%), game play (17 vs. 14%), and free play (24.3 vs. 10.9%) activities.

It has long been recognized that physical education has the potential to influence students' physical activity levels in and outside of school (Sallis & McKenzie, 1991). Previous research, however, indicates that unpleasant experiences in physical education related to lack of enjoyment, lack of opportunity, poor self-image, and lack of athletic competence has been a factor negatively affecting physical activity participation (Carroll &

Loumidis, 2001). Research indicates this is particularly true among adolescent females in coeducational physical education classes (Osborne, Bauer, & Sutliff, 2002; Taylor et al., 1999).

One possible explanation for female students' lower levels of enjoyment and activity during coeducational physical education is the traditional emphasis on team sports (Williams, Bedward, & Woodhouse, 2000). Metheny (1965), reflecting upon the attitudes of college aged women in the early 1960's, was the first to propose that acceptable sports for girls and women were individual activities that emphasized aesthetics. Research has supported Metheny's model indicating that girls prefer individual activities, such as dance and gymnastics, while boys tend to prefer team sports (Carroll & Loumidis, 2001; Bradley et al., 2000; Williams et al., 2000; Goudas & Biddle, 1993). Goudas and Biddle (1993) in a sample of 254 eighth and ninth grade boys and girls found that the majority of girls preferred individual activities, while the majority of boys preferred team sport games. In the same sample, only 9.6% of girls preferred team games, and 5.7% of boys preferred individual activities. A similar study by Williams et al. (2000), in a sample of 2,993 high school students, found 74% of girls preferred individual games, and 83% of boys preferred team games. Fromel, Vasendova, and Krapkova (2000) found that girls preferred activities with an aesthetic orientation, such as rhythmic gymnastics.

The preference for individual activities among adolescent girls could also be influenced by the lack of opportunity to participate in team sport activities during coeducational physical education due to dominance and preference given to boys (Olafson, 2002; Davis, 2000; Taylor et al., 1999). The passage of Title IX in 1972 prohibited sexual discrimination in education. As a result most secondary level public schools made the choice to shift from same-sex to coeducational physical education classes. However, the integration of boys and girls into coeducational physical education classes does not guarantee equal treatment (McBride, 1990). Scraton (1990) interviewed

physical education department chairs and teachers, and found the dominant assumption of girls' physical education teachers is that girls are less physically capable than boys, and should avoid activity that could be of danger to them. Nilges (1998) conducted a study to determine how girls are perceived in physical education by teachers, and implied that girls are treated as second-class citizens in the physical education classroom. Griffin conducted a study of middle school activity patterns for boys and girls. According to Griffin (1984), some teachers argue that boys hold back in physical education, and that class becomes watered down because of girls' low skill level. In Griffin's (1985) study the teachers complained that boys play too rough for girls, and that girls are reluctant to participate in a game.

As a result of the perceived male dominance in physical education, researchers have begun to question girls about their experiences in physical education, and whether they may prefer having physical education separate from boys (Cockburn, 2001; Olafson, 2002; Osborne et al., 2002; Taylor et al., 1999). Cockburn (2001) conducted a survey of 75 ninth-grade girls' feelings towards coeducational physical education. Almost one-third of the respondents said they were discouraged by being in class with boys. Similarly, almost one-fourth of the respondents said they would be encouraged by being in a class with just girls. Other aspects of physical education that girls did not enjoy included the risk of injury, aggression, and rough physical contact. These risks are generally associated with male sports and boys' participation in coeducational physical education.

Olafson (2002) conducted individual interviews and focus group interviews with adolescent girls about their experiences in school. The girls indicated that physical education is often embarrassing for them. Many of the girls felt like the boys were staring at them. Changing into shorts and a t-shirt put the girls' bodies on display for the males. One girl commented that boys would make comments about her chest size. Girls also felt that the boys would make fun of them if

they did something incorrect in an activity. One girl commented that she just stood on the field and avoided contact with the ball so that no one could comment. Many of the girls in the study disliked the focus on traditional team sports and military style forms of exercise. Classes with girls' only were mentioned by many participants as a possible way to increase attendance and enjoyment of physical education.

In a related study, Osborne et al. (2002) conducted individual interviews with 12 (six boys, six girls) seventh and eighth grade students to assess their feelings about coeducational physical education and girls-only physical education. All of the participants in the study had experience in coeducational and separate gender physical education. Of the themes that emerged from the data, only varied interaction was supportive of coeducational classes. The students welcomed the opportunity to interact with the opposite sex. The remaining five themes (interpersonal issues, effort/cooperation, same gender interaction, contact sports, and flexibility/low intensity sports) were all in favor of separate gender physical education classes. The girls felt that boys were not cooperative enough in class, and the boys felt that girls did not exhibit a high enough effort. Both boys and girls valued the opportunity that separate classes allowed for them to have same sex interaction. The boys and girls also felt that separate classes would allow them to focus on activities more suited for them.

The idea that single-gender physical education settings may result in a higher number of interactions with teachers and greater participation opportunities for female students has gained a considerable amount of attention (Davis, 2000). A recent study by Derry and Allen (2004) found that girls in single-gender physical education classes had significantly higher engaged skill learning time and initiated more interactions with teachers than girls in coeducational classes. Another advantage to single-gender settings is that females would not be subject to sexual objectification and the male gaze during physical education classes

(Olafson, 2002). Finally, single-gender settings would allow girls to participate in activities that they tend to find highly enjoyable and would allow them to develop skill in activities that traditionally have not been available to them (Osborne et al., 2002). In order to assess whether single-gender settings would be of benefit by increasing girl's opportunities to participate and interact with teachers in physical education settings, further investigation is needed. The purpose of this study was to examine high school students' opportunities to participate and interact with teachers during flag football, soccer, and ultimate Frisbee game play in a coeducational and single-gender physical education setting.

## Methods

### *Participants and Setting*

Data collection took place at an ethnically diverse, Southeastern United States, urban high school. The schools racial and ethnic distribution consisted of 47.84% Caucasian, 46.74% African-American, 2.96% Hispanic, 1.24% Asian, 1.10% Multicultural, and 0.14% American Indian students. Participants included 67 students, 32 males (mean age  $14.8 \pm .83$  years old) and 35 females (mean age  $14.6 \pm .91$  years old), enrolled in two intact coeducational physical education classes. For the purposes of this study, one coeducational class remained coeducational during game play and the other coeducational class was split into male and female teams for game play. The team sports, flag football, ultimate Frisbee, and soccer constituted the yearly Fall semester curriculum in physical education at this school. Classes met daily for 90 minutes in a block schedule format. The data for this study was collected from a sub-sample of a larger study on student physical activity levels. Data collection took place from the beginning to the end of the Fall school semester.

Two experienced male physical education teachers conducted all physical education classes. One male teacher had 19 years of physical

education teaching experience and a degree in physical education teaching K-12 from an accredited physical education program at a large Southeastern United States University. The other male teacher had 27 years of physical education teaching experience in Puerto Rico and the United States and a Doctorate degree in physical education from a large Southeastern United States University.

Permission to conduct the study was obtained from the University Institutional Review Board, the school district, the school administration, and the teachers prior to the start of the study. The students and parents provided written informed assent and consent prior to participation in the study.

#### *Instrumentation*

A modified version of a portion of the Observational Recording Record of Physical Educator's Teaching Behavior (Stewart, 1989) was used to monitor the type and rate of teacher/student verbal interactions. The instrument was originally designed to monitor instructional climate, interaction, teacher behavior, or any combination thereof. For the purposes of this study the instrument was used to monitor type of interaction (individual, group, or class) and who the interaction was with or directed towards (male, female). Original observer reliability for the interaction portion of the instrument was calculated at ninety-one percent. Prior to data collection observers received training from the primary investigator on how to use the instrument and practiced live observation and recording. Inter-observer reliability prior to data collection was calculated at ninety-one percent. Inter-observer reliability was also calculated on three occasions during the study. Observers scored 91%, 100%, and 100% inter-observer reliability with the master coding done by the primary investigator.

Recording sheets with tally boxes labeled male and female were used to record opportunities to participate during game play. Each time a male or female student touched the football, soccer ball,

or Frisbee one or more researchers recorded the occurrence on the sheet.

#### *Data Collection Procedures*

Prior to the start of data collection the teachers and primary investigator met to discuss class procedures and game rules. Lessons were developed by the teachers and primary investigator to assure similarity between all classes. Teachers agreed to an approximate length of 30 minutes for game play in each 90 minute class. Two games were played simultaneously on an equally divided regulation football field. Every class was observed by two or more of the researchers and notes were taken to verify that the lesson organization and type of activity conducted by each teacher for each group was similar. Data were collected across five days of game play in each team sport unit.

During the middle ten minutes of each allocated 30 minutes of game time activity one or more researchers recorded students opportunities to participate during game play on each field. An opportunity to participate was defined as a touch of the football or soccer ball or Frisbee during the game. The students were unaware that their participation, in terms of contact with the ball or Frisbee, was being recorded so as not to affect their normal participation style. The researchers walked around the field in close proximity to the students engaged in game play in order to record each touch of the ball or Frisbee. Recorded touches were limited solely to students engaged in field game play. Any touches by students sitting out or students from another class were not recorded.

During the same middle 10 minutes of data collection for each 30 minute game, one or more researchers recorded teacher verbal interactions with students. Teacher interaction was defined as any verbal communication directed towards a student or group of students. The teachers were not told that interactions were being recorded so as not to affect their normal supervision style. The middle ten minutes of class was selected because

research indicates active supervision (i.e. interaction rate) is associated with increased moderate to vigorous physical activity in physical education (Schuldheisz & Van der Mars, 2001). Previous research has demonstrated that many physical education teachers tend to regress into a passive supervision style of silent observation after the start of physical activity (Anderson & Barette, 1978). The researchers walked around the field in close proximity to the teacher in order to record each verbal interaction. Recorded interactions were limited solely to students engaged in field game play. Any interactions with students sitting out or students from another class were not recorded.

#### *Data Analysis*

Statistical analysis for all data in this study was conducted using Statistical Package for Social Science (SPSS) software version 12.0 (SPSS, Inc., Chicago, IL, USA). Data were entered and confirmed by another researcher to assure reliability of the results. Descriptive statistics were used to determine the average teacher verbal interactions with students (individual, group, whole class) per game. One-way ANOVA's were used to test for differences in opportunities to participate between coeducational and single gender settings for male and female students. An alpha level of 0.05 was used for all statistical tests.

### **Results**

#### *Opportunities to Participate during Game Play*

Results indicate that male students in the single gender setting had significantly fewer touches per game during flag football ( $F_{1,9} = 5.8, p < 0.04$ ), and soccer ( $F_{1,9} = 110.6, p < .000$ ) versus males in the coeducational setting. Female students in the single gender setting had significantly more touches per lesson during flag football ( $F_{1,9} = 13.5, p < 0.006$ ), ultimate Frisbee ( $F_{1,9} = 23.7, p < 0.001$ ), and soccer ( $F_{1,9} = 10.2, p < 0.013$ ) versus females engaged in coeducational game play.

Table 1 summarizes the average number of touches per lesson (mean  $\pm$  SD) for male and female students in coeducational and single gender game play settings.

#### *Results from Modified Observational Recording Record of Physical Educator's Teaching Behavior*

Frequencies data in Tables 2, 3, & 4 depict that when the total average interactions were considered, regardless of activity type, there tended to be little difference in overall teacher interactions between students in coeducational and single gender settings. Further examination of the data revealed a trend in the distribution of the interaction pattern in coeducational and single gender settings. When combining individual and group interaction data female students tended to receive more teacher verbal interaction during single gender game play versus coeducational game play in each activity. For males, the combined individual and group interaction pattern varied by activity. Male students tended to receive slightly fewer teacher interactions during flag football in single gender versus coeducational game play. They tended to receive slightly more teacher verbal interactions during ultimate Frisbee in single gender versus coeducational game play with no difference in interaction trends during soccer game play. When examining solely group interaction data there is a trend towards greater teacher verbal interaction for both males and females engaged in single gender game play. Teacher interaction directed at groups of students during coeducational game play tended to be almost exclusively mixed sex.

### **Discussion**

Results from this study provide support that female students in single gender physical education settings may receive more opportunities to participate during flag football, ultimate Frisbee, and soccer game play. Results also reveal a trend towards teachers providing a higher rate of group verbal interaction to female students in single gender settings, although this was not tested

**Table 1**  
Average Touches during Game Play for each Activity

	Males	Females
Flag Football:		
Coeducational	*48.6 ± 13.1	11.8 ± 6.9
	(n = 17)	(n = 20)
Coed-split	33.4 ± 5.3	*26.4 ± 5.5
	(n = 15)	(n = 15)
Ultimate Frisbee		
Coeducational	80.2 ± 12.0	28.6 ± 4.4
	(n = 17)	(n = 20)
Coed-Split	68.2 ± 5.1	*51.2 ± 9.4
	(n = 15)	(n = 15)
Soccer:		
Coeducational	*61.6 ± 3.9	30.6 ± 2.9
	(n = 17)	(n = 20)
Coed-split	31 ± 5.1	*47.2 ± 11.2
	(n = 15)	(n = 15)

\* Significant at  $p < .05$

**Table 2.**  
Average Teacher Verbal Interaction per Class of Flag Football by Gender

	Coed	Coed Split
Individual:	3.17	2.50
Male	2.33	0.33
Female	0.83	2.17
Group:	4.50	4.67
Male	0	0.33
Female	0	4.33
Both	4.50	0
Whole Class:	0	0
Total Interactions:	7.67	7.17

Note: Interaction = verbal comment

**Table 3.**  
Average Teacher Verbal Interaction per Class of Ultimate Frisbee by Gender

	Coed	Coed Split
Individual:	2.67	1.33
Male	0.83	0.50
Female	1.83	0.83
Group:	2.33	4.33
Male	0.17	1.50
Female	0.17	2.83
Both	2.00	0
Whole Class:	0	0
Total Interactions:	5.00	5.67

Note: Interaction = verbal comment

**Table 4.**  
**Average Teacher Verbal Interaction per Class**  
**of Flag Football by Gender**

	Coed	Coed Split
Individual:	6.60	5.83
Male	4.40	3.00
Female	2.20	2.83
Group:	6.00	5.00
Male	0	2.00
Female	0	3.00
Both	6.00	0
Whole Class:	1.80	0
Total Interactions:	14.40	10.83

Note: Interaction = verbal comment

statistically. These findings support previous research in which engaged skill learning time and student-initiated interactions were found to be significantly in favor of single gender physical education classes (Derry & Allen, 2004). These findings also support qualitative literature in which female students have expressed that a single gender setting would provide them with greater opportunity to participate in class activities (Olafson, 2002; Osborne et al., 2002; Taylor et al., 1999).

A plausible reason why the single gender setting increased female students' level of participation was the elimination of male dominance during game play. This is illustrated by the significant reduction in male students' touches of the ball in the single gender settings during flag football and soccer game play. The coeducational game play setting allowed males to dominate possession of the ball or Frisbee on both fields of play, limiting the opportunities of females to

participate. When separated into playing fields by gender, the number of touches during 10 minutes of game play became more equally distributed between male and female students.

Another reason female student participation may have increased was the trend towards greater teacher-initiated verbal interactions in the single gender setting. Studies have demonstrated that higher rates of teacher interactions with students result in significant increases in moderate to vigorous physical activity levels (Schuldheisz & Van der Mars, 2001; Van der Mars, Vogler, Darst & Cusimano, 1998). Although the total number of teacher verbal interactions was similar for each setting, the distribution of interaction type and direction varied. Teacher interaction directed at groups of students during coeducational game play tended to be almost exclusively mixed sex. A greater number of interactions were directed at groups of females in the single gender setting possibly providing motivation to increase participation during flag football, soccer, and ultimate Frisbee game play.

Although the present study did not investigate student perceptions, a reason for the increase in female student participation in the single gender setting may be the creation of a non-threatening supportive environment. Previous research has indicated that female students have concerns over being embarrassed and harassed by male students for doing something wrong during game play in coeducational physical education (Cockburn, 2001; Olafson, 2002). Less pressure to perform and win may give less skilled females a sense of security in attempting skills in which they may not feel proficient. Increased opportunities to participate and become involved in game strategy may allow females to develop greater skill proficiency and game knowledge necessary for more competitive game play.

#### *Limitations*

Generalizations of the results of this study should not be made to all types of physical education activities and to all student populations. The

opportunities to participate and teacher verbal interaction data were only collected during game play for three team sport activities at one school. Individual activities and different team sports may have different results. Additional studies using individual activities in addition to team sport activities are warranted. Although the focus of this study was on game play, other studies investigating participation rates and teacher interactions during warm-up and skill development tasks would be helpful in adding to the limited available research data. Since this study did not evaluate skill ability and track female and male students of different ability, it could be true that hi-skilled females get more touches and teacher interaction in the coeducational setting than many of the males. Studies are needed to investigate the effects of coeducational and single gender physical education settings on students of varying skill level. Another limitation of this study was the use of two different teachers. Although the teachers were prepared to conduct classes in a similar manner, and overall class interaction rates were similar, the interaction patterns of the teachers varied somewhat. It is not totally clear if that was a result of the instructional settings or individual teacher characteristics. A research design that compares the same teachers with the same students in all gender settings would be an improvement.

### *Conclusions*

In summary, the results of this study suggest that female students have more opportunities to participate and tend to receive a greater amount of group teacher verbal interactions while engaged in single gender flag football, ultimate Frisbee, and soccer game play. Based on the current research, it may be beneficial to separate males and females when playing team sport games in physical education class. It is important to note that the current study did not violate school district policy by creating exclusively single gender classes. The classes began as coeducational and were separated into two different fields

for the sole purpose of game play. The philosophy of Title IX is to provide equal participation opportunities for both high school aged males and females in physical education. The coed-split format in this study actually resulted in a more equal distribution of participation opportunities between males and females compared to the traditional coeducational setting.

Even if single gender game play may indicate more practice tries and teacher interaction, there still remain benefits for coeducational physical education. Specifically, highly skilled, athletic, and competitive female students may benefit from playing with and against males. It is also important to recognize that previous research has indicated that both male and female students value the varied gender interaction of coeducational physical education (Osborne et al., 2002). The varied gender interaction students receive in coeducational settings supports two national content standards for physical education (NASPE, 2004): Standard 5) Exhibits responsible personal and social behavior that respects self and others in physical activity settings; and Standard 6) Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction. It could be argued that these goals can be accomplished in single gender physical education settings. However, the fact that as adult's males and females will need to cooperate in health club and recreational activity settings supports that these standards may be better applied and evaluated in coeducational physical education settings.

Teachers may use this information to construct coeducational physical education classes so that mixed gender activities are used for socialization purposes, but separate gender grouping strategies are used to increase movement opportunities during certain types of activities. For instance, teachers may maintain a coeducational setting for warmups and conditioning activities then chose to separate male and female students to provide a more effective learning environment during skill drills and game play in team contact sports like flag football and soccer. It is important for

teachers to remember that grouping students into coeducational or single gender settings is simply an instructional tool. It is up to an individual teacher to evaluate the teaching context and determine the best grouping strategy to maximize their students' movement and learning opportunities. Until further research is conducted and disseminated it remains unclear whether the instructional setting itself, instructional practices of the teacher, or a combination of both are most responsible for student participation and teacher interaction with students in physical education.

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