Gender differences in the game behaviour in invasion games

David Gutierrez* and Luis M. Garcia-Lopez

Facultad de Educacion, University of Castilla-La Mancha, Didactica de la expresion musical, plastica y corporal, Ronda de Calatrava 3, Ciudad Real, Spain

(Received 17 September 2011; final version received 24 April 2012)

Background: Previous research has revealed the existence of gender differences in physical education. Most descriptive studies show that boys are more physically active than girls, have greater self-perception of enjoyment and competence in physical education, attach more importance to sports and participation in them and demonstrate higher game performance in invasion games. There also exist different participation and learning patterns. Experimental studies have shown that with the correct methodology some of these differences can be modified and that stereotypes are dynamic and depend to a large extent on the interactions that occur during the learning process.

Purpose: It was the purpose of this study to evaluate possible gender differences in the game behaviour of physical education students in terms of participation and offensive tactical behaviour in invasion games with mixed teams.

Methods: The participants were boys (n = 31) and girls (n = 43) in four age groups (primary years two, four and six and secondary year two; aged 7–8, 9–10, 11–12 and 13–14 years). Offensive game behaviour was evaluated during game play through the number of attacker-on-the-ball actions (AonBA; passes, movements on the ball and shots), and the percentage of offensive actions related to a specific offensive tactical intention (OTI; keeping the ball, penetrating the defense, scoring and spectator-player). Students were evaluated through a modified invasion game, where the technical and rules requirements were minimised and adjusted to the developmental characteristics of the participants.

Results: The results showed that boys participated more in offensive play with the ball, especially in the number of movements on the ball (boys, $M = 10.5$; girls, $M = 6.4$; $p < 0.01$) and shots (boys, $M = 3.3$; girls, $M = 1.2$; $p < 0.01$). Analysis of OTI revealed differences in intention to score (boys, $M = 6.1$%; girls, $M = 3.5$%; $p < 0.01$) and in actions such as spectator-player (boys: 3.1; girls: 6.4; $p < 0.05$). In analysis by age groups the greatest differences were detected in the oldest group.

Conclusions: The results confirmed the existence of stereotypical forms of participation in invasion games. The boys focused on handling the ball and achieving the goal, while the girls displayed more off-the-task (spectator-player) behaviours. The results were consistent with most studies demonstrating gender behaviour in physical education, with differences increasing in adolescence.

Keywords: gender; invasion games; game behaviour; physical education; games teaching

*Corresponding author. Email: david.gutierrez@uclm.es
Introduction

A large number of studies have been written concerning gender differences in physical education and in sporting activities. Most of these studies have confirmed the existence of differences, demonstrating in general terms that girls are less involved in and motivated about sporting and physical activities and physical education, especially in relation to sports games. An analysis of literature also shows that boys are more physically active than girls in in-school and out-of-school activities. Armstrong and Welsman (2006) reviewed studies on the European population and found similar patterns in all of these. In all age groups, girls are engaged in less physical activity than are boys, especially vigorous activities. However, a recent study (Van Acker et al. 2010) revealed how 13-year-old Portuguese and Belgian girls recorded higher levels of physical activity than boys in physical education classes when activity is centred on modified invasion games. Another area in which a number of studies have been carried out is in the attitudes and self-perception of students in terms of physical education and physical activity. Although there are studies in which no differences are found (e.g. Horn and Hasbrook 1987), most of them show that boys have more positive attitudes, greater perceptions of enjoyment and greater self-perceptions of competence than girls (e.g. Cervello et al. 2004; Stelzer et al. 2004). Furthermore, studies such as those conducted by Fredricks and Eccles (2002) or Jacobs et al. (2002) showed that boys like sport more than girls do and attach more importance to participation. This higher level of importance increases with traditional physical education sports (Carroll and Loumidis 2001). There is, however, a paucity of research evidence analysing students’ physical education-specific self-efficacy (Hilland et al. 2009) and as a result there are very few studies providing data on comparisons of game performance and participation between boys and girls. Richard, Godbout, and Grehaigne (1998) assessed game performance in a modified basketball game. In this study, boys in all the age groups (aged 10–14 years) performed better in all the variables evaluated. Nevett et al. (2001) assessed decision-making, pass execution, moving into space and execution in receiving the ball by students aged 9–10 in a modified invasion game following a 12-session unit. At the end of the didactic process, the boys showed they performed better at moving into space. Hastie (1998) used responses and the level of success to measure and compare the participation of boys and girls during a season of sport education (floor hockey). In the three phases analysed (skills practice, pre-season scrimmages and formal competition), the boys had more opportunities to respond and more success in their responses. In the competition phase, which provided the conditions most closely matched to our study, there were significant differences in both sections. In a study carried out with primary year four, five and six students playing a game involving retention of the ball, Castejon and Lopez-Ros (2000) did not observe any gender-related difference in game performance, but did detect a difference in participation. The boys completed more passes than did the girls, the difference being noted in ranges with a low number of passes, where more girls appeared than boys. However, there were a similar number of boys and girls in the category of ‘players completing most passes’.

Gender is a dynamic concept, as it is created and re-created by human interaction and social life (Lorber 1994), it is cultural and it is permanently under construction (Butler 2004). As a social activity, physical education contributes to the social construction of gender (see revision of Penney 2002), especially in activities that have an intrinsic relational component as invasion games, in which the use of skills as throwing and catching involves players’ ‘interpreting, constructing, and responding to the physical-perceptual and social-interactive dimensions of the learning environment’ (MacPhail, Kirk, and Griffin 2008, 106).
Verscheure and Amade-Escot (2007) carried out a study on the social construction of gender in the pedagogical practices of teaching and learning in physical education. The authors analysed how knowledge is constructed and the offensive behaviours of 16-year-old students during two volleyball units. This study introduces an interesting concept in gender studies: the gender position activated in context. Depending on whether the response to the offensive situation activated by the student matched a specific stereotype, the gender position was coded as male stereotype (spike the ball), female stereotype (tip the ball into a free space) or a balanced mode of attacking (attack in relation to opponents), the latter option indicating tactical awareness and understanding of the game. Only among the girls, there was any correspondence between the gender and the gender position (three of the four students linked to the female stereotype were girls). Verscheure and Amade-Escot noted that five of the six students linked to a balanced gender position (the situation indicative of a higher skill level) were boys. According to the author, rather than being static, gender identity evolves during the learning period, depending on the student’s interpretation of the interactions occurring in the teaching context. As a result, in order to understand the social construction of gender, the enacted curriculum must be explored at a micro-level. These studies seem to confirm, while also qualifying, the notion of gender participation patterns shown in the studies carried out by P.S. Griffin (1984, 1985).

Although they have no explicit link to physical education, there are phenomenology-based studies that show the various uses of the body and space by men and women and which provide an important insight into social and gender-related construction of motor behaviour. A representative work of this area is that carried out by Young in *Throwing like a girl* (1980). According to Young, women use less space in executing skills and do not use the body in its entirety in physical activities. Women focus on the parts of the body directly involved in the task (the hand, wrist, etc.) and make mistakes in continuing the movement. They also adopt a more passive and ‘reactive’ stance to events in sporting activities, in contrast to the more ‘proactive’ behaviour of boys.

The reasons for the above-mentioned gender differences are unquestionably diverse and socially constructed to a large extent. As part of this construction, the role of the school and physical education in particular is very important. Verscheure and Amade-Escot (2007) point to two main factors to explain the nature of gendered schooling: the hidden curriculum and the unequal interactions between the teacher and female and male students (Waddington, Malcolm, and Cobb 1998). To these two factors it should be added the greater representation of typically masculine activities in the so-called multi-activity sports curriculum (Hastie and Siedentop 1999; Kirk 2003).

The aforementioned gender differences and disparities detected in social interactions during physical education (Brock, Rovegno, and Oliver 2009) could explain why boys and girls behave differently during game play in team games, especially in terms of game involvement and social interaction. Furthermore, although most students like interacting with the opposite sex in physical environments (e.g. Hill and Cleven 2005), there are situations in which students feel uncomfortable playing together (Osborne, Bauer, and Sutliff 2002). This game behaviour may thus differ when boys and girls play together and when they play in separate teams.

The purpose of our study was to ascertain if there were gender differences in game behaviour in invasion games with mixed teams. Although there are many studies that address gender issues in physical education, there is limited research on the way girls and boys behave tactically when they play together in same teams. In this sense, this study aimed to contribute to the literature in games teaching in coeducational contexts, by facilitating
teachers’ understanding of their students’ behaviour and game performance, and by doing so, helping them to improve their teaching.

Game behaviour was evaluated through two different measures: participation and tactical intention. Participation was assessed through the number of attacker-on-the-ball actions (AonBA): passes, movements on the ball and shots on goal. To assess offensive tactical intention (OTI), we used Bayer’s (1979) categorisation of the action principles of attacking (keeping the ball, penetrating the defense, scoring). This classification was complemented by the concept of the spectator-player to describe actions in which players fail to show any tactical intention or involvement in the game. This variable was used to measure the level of involvement in the offensive play of the players.

The literature shows that there are different patterns of participation (Griffin 1984, 1985) and that the male stereotype is oriented more towards achieving the goal, as opposed to the female one, which is oriented towards collaboration and reacting to game events rather than reaching out into and actively seeking to determine them (Young 1980). However, these patterns of behaviour are not static and are conditioned to a large extent by the interactions occurring during teaching (Verscheure and Amade-Escot 2007). Hence, it was hypothesised that girls would participate less than boys in offensive behaviours requiring greater initiative, opting to provide support and react to events instead of directly looking to achieve the goal, and that these differences would be greater in older age groups.

Methods

Participants and procedures

The sample was made up of four age groups: primary years two (P2), four (P4) and six (P6) and secondary year two (S2) (aged 7–8, 9–10, 11–12 and 13–14 years). These age groups were selected to include educational stages in which Spanish curriculum prescribes to teach sport and games by categories. Furthermore, having two years between them creates the opportunity to better appreciate possible differences or progressions. Players were randomly selected from among physical education students with no formal training in invasion games and without any experience in official competition. Students belonged to intact class groups and were grouped in teams by their physical education teachers. Physical education teachers used two criteria for gathering students: (1) teams should be formed by girls and boys, and (2) teams should be close in skill level.

Students were evaluated through a modified invasion game based on those used in similar research in educational contexts (Nevett et al. 2001; Blomqvist, Vänttinen, and Luhtanen 2005). Game-structure was designed to ensure developmental appropriateness and facilitate player’s success. Technical and rule requirements were minimised. Based on the proposal of Mitchell, Oslin, and Griffin (2003), the number of players per team and the size of the playing field were also adjusted to participants’ developmental features. Table 1 summarises the ages, numbers of players per team and game form in each group. The objective was to score goals by throwing the ball into the goal, with the following secondary rules (Gutierrez et al. 2011): (1) there were no goalkeepers; (2) moving on the ball was possible just by bouncing the ball; (3) there was no double-dribble rule; (4) stealing the ball from an opponent and physical contact was not permitted; (5) after a foul, the game was restarted from the place where the infraction took place; (6) throwing the ball to score from
the own half part of the court was not permitted; (7) only ‘one-on-one’ defense was permitted, between pairs of attackers and defenders as established previously by teachers. One-on-one defense was important in that the matching of opposing players with similar skill level enabled differences in technical ability to be more easily controlled. All games lasted eight minutes, divided into two halves. This length of time was similar to those established in similar studies (French and Thomas 1987; Nevett et al. 2001; Blomqvist, Vänttinen, and Luhtanen 2005). Physical education teachers refereed.

**Coding instrument**

All matches were recorded with a video camera located behind and above the court and analysed using the Game Performance Evaluation Tool (G-PET) (Gutierrez 2008). This instrument has been used in other studies for describing previous learning in soccer players (Gonzalez et al. 2010, 2011) and invasion games (Gutierrez, Garcia-Lopez, and Contreras 2009, Sanchez-Mora et al. 2011) and to describe differences between experts and novices in invasion games (Gutierrez et al. 2011). For coding purposes, the playing time was divided into decision-making units of action (Nevett et al. 2001). The ending of a decision-making unit occurred: after four seconds of action; when the player performed a different technical–tactical skill; or when the offensive tactical context changed. Content validity was established by a panel of experts. Instrument reliability was established through test–retest procedures, with intra- and inter-observer correlations among the observers in all categories ranging from 0.77 to 1.00.

**Measures**

Evaluation of game behaviour focused on attack. As it is above mentioned, Bayer (1979) describes three action principles for attack, and he also describes three for defense. Defensive principles are direct consequences of attack principles (e.g. defending space defense principle is a reaction to penetrating the defense attack principle), thus it was felt that attack is the phase of play that requires greater initiative on the part of the player and which is therefore more indicative of the level of involvement as well as tactical intention. Offensive game behaviour was evaluated through AonBA and OTI. In AonBA, we analysed the number of completed actions on each attacker-on-the-ball related to technical–tactical components: passes, movements on the ball (all the actions in which the player maintained possession of the ball: dribbling and one-twos) and shots, as well as the total number of completed actions by the attacker-on-the-ball. OTI was evaluated by coding the action of the attacker-on-the-ball and the attacker-off-the-ball in line with Bayer’s (1979) categorisation of the action principles of attacking: keeping the ball, penetrating the defense and scoring. This categorisation was
complemented by the concept of the spectator-player to describe actions in which the attacker-off-the-ball fails to show any tactical intention or involvement in the game. The following criteria were used to designate OTI (Gutierrez 2008):

Attacker-on-the-ball:

- The action is coded as an intention to keep the ball when the player:
  1. runs with the ball, dribbles or plays a pass, although neither they nor the player receiving the pass moves closer to the goal (at a shorter distance in a straight line from the goal or in a position from which they can score),
  2. remains in the same place (for more than four seconds, the time reference adopted by L. Griffin et al. 2001) while playing a one-two (there is a defender close by) or not performing any technical—tactical move.

- The action is coded as an intention to penetrate the defense when the player places or is about to place the ball in a position that is closer to the goal, either by means of a pass or by running or dribbling with the ball.

- The action is coded as an intention to score when the player shoots on goal with the intention of scoring.

Attacker-off-the-ball:

- The action is coded as an intention to keep the ball when the player makes a decoy run (providing defensive balance) closer to their goal than the ball or moves into space or is already in space to receive possession in a position closer to their goal than the position of the ball.

- The action is coded as an intention to penetrate the defense when the player moves into space or is already in space to receive possession in a position closer to the opposing goal than the position of the ball, or moves into space in any direction in order to receive an assist or make a decoy run to help their teammates to attack.

- The action is coded as spectator-player when he or she does not show tactical intention or involvement on the game.

Statistical analysis

The means and standard deviations were calculated for each variable and for each of the participating groups. The number of AonBA and the percentage of OTI were compared between boys and girls in same-age groups and using the full sample. Effect sizes $r$ were calculated. The Kolgomorov–Smirnov test for assumption of normality and the Levene test for homogeneity of variance showed that the sample did not meet these assumptions for all the variables in the study. Therefore, and also due to a small sample size, a Mann–Whitney U-test was conducted to analyse for differences between the two samples (Vincent 2005).

Results

Table 2 shows that, on average, boys in P2 performed more AonBA than did girls in all variables except passing. There were significant differences in the number of shooting actions (boys, $M = 4.4$; girls, $M = 1.9$; $p < 0.05$). As regards OTI, comparison of the statistics revealed significant differences in favour of the boys in intention to score (boys, $M = 7.8\%$; girls, $M = 4.1\%$; $p < 0.05$). Results showed that the average percentage
for girls behaving as spectator-players in offensive actions was more than twice as high as it was for boys (boys, $M = 3.2\%$; girls, $M = 7.7\%$).

In the P4 group, the boys recorded a higher AonBA average than did the girls in all the variables (Table 2). Although clear differences existed, particularly in terms of shots (boys, $M = 3$; girls, $M = 1.5$; $r = 0.48$) and the AonBA total (boys, $M = 24.5$; girls, $M = 18.5$), in none of the variables was the difference statistically significant. The percentages of actions linked to each OTI were very similar for boys and girls. The most noticeable difference in this section arose in intention to score (boys, $M = 5.2\%$; girls, $M = 4.1\%$; $p < 0.05$; $r = 0.31$) and in spectator-player (boys, $M = 3.2\%$; girls, $M = 5.6\%$).

Table 3 shows that, on average, the boys in P6 performed more AonBA than did the girls. The only similar results in this section were for passing. Although they were not statistically significant, the greatest differences were registered in the number of shots (boys, $M = 2.8$; girls, $M = 0.6$). As with the previous age groups, the percentages for actions linked to tactical intention were very similar for boys and girls. The biggest differences were recorded in intention to score (boys, $M = 5.1\%$; girls, $M = 3.3\%$) and again in spectator-player (boys, $M = 4.2\%$; girls, $M = 6.2\%$).

In S2 (Table 3) the differences in the number of AonBA were higher than in previous age groups and were in favour of the boys in all cases. The differences were significant except in the number of shots. As in the previous age groups, the percentage of actions linked to tactical intention was similar for both the boys and the girls. Similarly, the biggest differences were recorded in intention to score (boys, $M = 5.8\%$; girls, $M = 2.7\%$) and in spectator-player (boys, $M = 2.3\%$; girls, $M = 6.5\%$).

Table 4 compares the results for boys and girls across the whole sample. It was noted that the boys performed more actions than did the girls in all attacker-on-the-ball-related technical–tactical components. These differences were significant in all cases except in
In terms of the percentages of actions relating to tactical intention, as noted in the analysis of each age group, the biggest differences arose in intention to score (boys, $M = 6.1\%$; girls, $M = 3.5\%; p < 0.01; r = 0.27$) and in spectator-player (boys, $M = 3.1\%$; girls, $M = 6.4\%; p < 0.05; r = 0.28$).

### Discussion

The aim of this study was to identify possible gender differences in game behaviour in a modified invasion game adapted to the developmental characteristics of the students and

---

**Table 3.** P6 and S2 groups. Comparison between boys and girls in AonBA and OTI.

<table>
<thead>
<tr>
<th>Variable</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>p</th>
<th>r</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>AonBA (average number of actions per game)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shots</td>
<td>2.8</td>
<td>0.6</td>
<td>0.23</td>
<td>0.46</td>
<td>2.9</td>
<td>0.9</td>
<td>0.06</td>
<td>0.46</td>
</tr>
<tr>
<td>Passes</td>
<td>4.8</td>
<td>4.8</td>
<td>0.96</td>
<td>0.0</td>
<td>8.2</td>
<td>2.7</td>
<td>0.02*</td>
<td>0.55</td>
</tr>
<tr>
<td>Movements on the ball</td>
<td>8.8</td>
<td>7.5</td>
<td>0.3</td>
<td>0.08</td>
<td>8.9</td>
<td>2.3</td>
<td>0.01*</td>
<td>0.54</td>
</tr>
<tr>
<td>Total AonBA</td>
<td>16.5</td>
<td>13</td>
<td>0.22</td>
<td>0.17</td>
<td>20 (12.6)</td>
<td>5.9 (5.9)</td>
<td>0.008**</td>
<td>0.58</td>
</tr>
<tr>
<td>OTI (average percentage of offensive actions per game %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to keep the ball</td>
<td>35.8</td>
<td>44 (16.4)</td>
<td>0.21</td>
<td>−0.26</td>
<td>20.6 (7.9)</td>
<td>26.9 (13.4)</td>
<td>0.41</td>
<td>−0.28</td>
</tr>
<tr>
<td>Intention to penetrate the defense</td>
<td>51.4 (11)</td>
<td>56.8 (18.9)</td>
<td>0.4</td>
<td>−0.17</td>
<td>75.0 (8.4)</td>
<td>80.8 (14.2)</td>
<td>0.31</td>
<td>−0.24</td>
</tr>
<tr>
<td>Intention to score</td>
<td>5.1 (5.3)</td>
<td>3.3 (2.2)</td>
<td>0.19</td>
<td>0.22</td>
<td>5.8 (4.3)</td>
<td>2.7 (3.2)</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Spectator-player</td>
<td>4.2 (5.8)</td>
<td>6.2 (8.6)</td>
<td>0.8</td>
<td>−0.13</td>
<td>2.3 (2.7)</td>
<td>6.5 (6.7)</td>
<td>0.15</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Note: Standard deviation in brackets.

*p < 0.05.

**p < 0.01.

**Table 4.** Complete sample. Comparison between boys and girls in AonBA and OTI.

<table>
<thead>
<tr>
<th>Variable</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>AonBA (average number of actions per game)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shots</td>
<td>3.3</td>
<td>1.2</td>
<td>0.0**</td>
<td>0.45</td>
</tr>
<tr>
<td>Passes</td>
<td>8.4</td>
<td>6.5</td>
<td>0.09</td>
<td>0.2</td>
</tr>
<tr>
<td>Movements on the ball</td>
<td>10.5</td>
<td>6.4</td>
<td>0.005**</td>
<td>0.28</td>
</tr>
<tr>
<td>Total AonBA</td>
<td>22.3</td>
<td>14.1</td>
<td>0.002**</td>
<td>0.34</td>
</tr>
<tr>
<td>OTI (average percentage of offensive actions per game %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to keep the ball</td>
<td>30.8</td>
<td>34.6</td>
<td>0.24</td>
<td>−0.13</td>
</tr>
<tr>
<td>Intention to penetrate the defense</td>
<td>63.4</td>
<td>68.4</td>
<td>0.59</td>
<td>−0.16</td>
</tr>
<tr>
<td>Intention to score</td>
<td>6.1</td>
<td>3.5</td>
<td>0.0**</td>
<td>0.27</td>
</tr>
<tr>
<td>Spectator-player</td>
<td>3.1 (4)</td>
<td>6.4 (6.9)</td>
<td>0.031*</td>
<td>−0.28</td>
</tr>
</tbody>
</table>

Note: Standard deviation in brackets.

*p < 0.05

**p < 0.01.
with mixed teams. In accordance with the prior literature, the girls demonstrate lower levels of physical activity and commitment in physical education (Armstrong and Welsman 2006) and less positive attitudes to physical activity in general and traditional sports in particular (Carroll and Loumidis 2001). The girls also show lower levels of self-perception of enjoyment and competence (Stelzer et al. 2004), these levels being linked to social relationships between teammates (Brustad 1996). In the few studies providing data on performance and participation in physical education classes, boys generally perform better (Hastie 1998; Richard, Godbout, and Grehaigne 1998; Nevett et al. 2001). Hence, it was hypothesised that girls would participate less than boys in offensive behaviours requiring greater initiative, opting to provide support and react to events instead of directly seeking to achieve the goal. As is the case with the gender differences described above, it was hypothesised that the differences would be more obvious in the older age groups.

Results of comparative analyses between the sexes confirmed the hypothesis. Gender differences were found in the playing behaviour. This different way of playing can be summed up by the fact that girls focused more on keeping the ball and boys more on scoring a goal. The biggest differences were found in actions and intentions related to scoring. The largest number of gender differences was found in the oldest age group (S2), in which boys participated significantly more in all offensive aspects. The youngest group (P2) also yielded significant gender differences, although in this group girls performed more passes than boys, and boys more shots than girls. These results are indicative not of less game involvement, as seems to be the case in S2, but of a different way of playing, with girls being more cooperative, and boys more focusing more on the goal than on their partners.

The results on game behaviour showed that in terms of tactical intention there were significant differences in the percentage of behaviours where the intention was to reach the goal. Although these differences were evident in all the age groups, they are only revealed as being significant when the complete sample was analysed. Surprisingly, the only group in which significant differences arose in individual analysis was P2. Following the logic of the aforementioned social construction for explaining why older boys perform better, in P2 the game stereotypes ought to be less pronounced. However, this is consistent with studies such as those conducted by Eccles and Harold (1991), who found that first grader boys (6–7 years old) rate themselves as more able than girls in sport. Boys also rate sports as more enjoyable, important and useful than do girls. This shows that the stereotype is in place at a very early stage, although it would take time for these stereotypes to influence levels of motivation and out-of-school support and practice, and in doing so, to be the cause of a different improvement in game performance.

As regards the AonBA, the differences between sexes were significant in P2 in shots and in S2 in the number of movements on the ball, passes and the total number of actions. In the complete sample, significant differences arose in all behaviours except in the number of passes. These results are partially consistent with those revealed by Castejon and Lopez-Ros (2000). In that study, boys and girls performed a similar number of passes, although there were more girls among the players who made fewest passes. In our study, the results show that in P2, P4 and P6 passing was the element in which boys and girls were most similar in terms of the number of actions. Furthermore, because girls performed a smaller total number of actions with the ball, analysis of passing in relation to the total number of actions with the ball reveals that girls used this skill in their play in a higher percentage than did boys. The girls thus used the pass more and the boys other more individualistic technical–tactical components, such as movements on the ball and shooting. In this sense, it could be argued that gender differences in the use of technical–tactical
components could be linked not to the motor pattern, but to their significance in the logic of the game.

The biggest differences between boys and girls arose in the oldest age group (S2). It was highly evident in this group that not only was the orientation of the offensive play of the girls more conservative, but they also participated less in offensive play. As was also the case with the AonBA, the girls made markedly fewer passes, which was the offensive behaviour in which girls equalled boys in the younger groups. Although statistical analysis provided no significant differences, this was the group in which were recorded the greatest differences in the spectator-player behaviour. These results are consistent with studies that state that gender stereotypes are emphasised during adolescence (Griffin 1984).

Actions were coded as spectator-player when players did not show tactical intention or involvement on the game, so results on this variable reflect the level of participation in the game. The girls displayed a significantly higher percentage than did the boys in actions in which they showed no tactical intention or involvement in the game, with the biggest differences arising in the oldest age group. In this case, this greater difference was not due to the lesser involvement of the girls in the S2 group in comparison with the rest of the groups, but to a reduction in passive behaviours among boys in S2 in this behavioural action.

The results reveal differences in the groups, which increase with age and are significant in the oldest age group. There are undoubtedly diverse reasons for these differences, which may be linked to the better overall game performance on the part of the boys (Richard, Godbout, and Grehaigne 1998), greater security with content catalogued as masculine (Scraton 1993) and the construction of the gender stereotype in physical education classes due to the hidden curriculum and the intervention of the teacher (Verscheure and Amade-Escot 2007).

The significance that the students attribute to a situation depends on the status and the role they play in the context in which the action unfolds (Schubauer-Leoni and Grossen 1993), and this significance influences their game behaviour. Behaviour, therefore, depends to a large extent on the distribution of roles and power relationships during play. This leads us to suggest that the forming of groups, either in line with the criteria of gender, friendship or performance, determines game behaviour and probably game performance.

This study seems to confirm that without explicit intervention gender stereotypes do exist among students and become evident when behaviours are assessed during play. With suitable interventions gender stereotypes may be modified and minimised. Studies such as those conducted by Hastie (1998) or Van Acker et al. (2010) show that methodologies such as Sport Education or the application of the pedagogical principles of the Teaching Games for Understanding (Butler et al. 2008) may be valid interventions. If they are to have any effect, they must come from a teacher who has been trained in these methodologies and is aware of the importance of the hidden curriculum and of the selection of content in the reproduction of stereotypes.

The main information used to establish parameters such as perceived physical competence originates from teammates; this parameter is also linked to acceptance in a group of peers (Brustad 1996). Thus, the increase of perceived competence hinges on emphasising social relationships in physical education classes (Craft, Pfeiffer, and Pivarnik 2003). In this respect, learning contexts in which knowledge is constructed at the same time as social relationships are suitable. Learning context where an improvement in performance is pursued, but in which, in order for this objective to be achieved, the involvement and effort of the whole group/team is necessary. Extended didactic units are also necessary to bring about these improvements (Hastie 1998). These conclusions lead us to believe that
the application of the pedagogical principles of Teaching Games for Understanding and the Sports Education model provides suitable means for challenging gender stereotypes in invasion games.

Furthermore, as part of the debate on mixed-sex or single-sex activities, single-sex teaching would not be the solution, as the negative influence of gender stereotypes may be reproduced and reinforced, both in single-sex physical education and in co-educative physical education (Scraton 1993; Penney 2002). In specific activities and context, in which stereotypes were already determined, enjoyment and successful learning are the objectives that should be pursued, for which purpose could be suitable to separate boys and girls. In this respect, special attention should be given to evaluation activities where performance could be influenced by students’ interactions as well as stereotypes. However, in didactic units of a long duration, co-educative teaching is highly appropriate for preparing students for life in society and improving on the specific objectives of physical education. As a result, both boys and girls may reduce gender stereotypes and even benefit from them, as revealed in the study conducted by Hastie (1998), where the girls said they made more effort because they believed that that behaviour was expected of them. In that study, the girls also said that they thought the boys were better and knew more about sport, and felt that this was the reason why, in playing in mixed-sex teams, they played better and enjoyed themselves more.

Despite having adapted game conditions to the development and experience characteristics of the students, our study shows that without specific and prolonged intervention, the manner in which participants played together reproduced stereotypes and gender differences. The most important tools for addressing this aspect in physical education are teachers who have been trained in methodologies emphasising individual success through group work (mixed groups), in the awareness of the importance of the hidden curriculum and their didactic intervention in general, as well as in the correct selection of content. These aspects should thus be addressed in training teachers, while emphasis should also be placed on the importance of social knowledge (Harding 1991), on educating physical education teachers on the importance of student voice and on creating physical education context that challenges dominant discourses and gendered power relations (Fisette 2011).

More information is required on various factors (performance, self-concept, previous experience and social relationships) and their influence on the behaviour of physical education students in invasion games. In this respect further research of the type carried out by Rovegno et al. (2001) or MacPhail, Kirk, and Griffin (2008), who apply a situational approach in order to ascertain the influence of social interactions in the learning and teaching of invasion games, is necessary.

References


