Preschool children's social play and involvement in the outdoor environment

Abstract

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Research Findings: The primary purpose of the present study was to examine the relationship between social play and involvement in the outdoor preschool environment. The study included 173 children ranging in age from 3 to 6 years (M_{age} = 3.95; *SD* = 0.82) and attending 19 preschools in the Basque Country (Spain). Fifty-one teachers (50 women, 1 man) also participated. Our results indicated that there is a relationship between social participation and involvement, and that group play is the type of play that best predicts greater involvement. No significant differences in levels of involvement were found between boys and girls, although gender was found to have a moderating effect on the relationship between the type of group play and involvement. *Practice or Policy:* The results are discussed with reference to the need to implement innovations in the outdoor preschool environment that have a positive effect on child development. The outdoor environment should promote social participation as well as gender equality and inclusion, and consequently it should be designed to offer both access to a natural environment and multiple opportunities for play.

Key words: social play; involvement; outdoor environment; gender; preschool.

In many European countries there has been a considerable increase in preschool attendance. In fact, the educational policy plan of the European Union predicts that 95% of preschool-age children will be enrolled by the year 2020 (European Commission/EACEA/Eurydice, 2013). Early childhood education benefits not only children, but also their families and society in general. However, the magnitude of these benefits depends on the quality of the education (Cassidy et al., 2005; Vandell, Belsky, Burchinal, Vandergrift, & Steinberg, 2010). Numerous studies have shown that high-quality preschools are associated with greater wellbeing and an improved social and emotional balance among children, as well as increased cognitive and language skills (Ärlemalm-Hagsér, 2006; Gialamas, Mittinty, Sawyer, Zubrick, & Lynch, 2014; Pinto, Pessanha, & Aguiar, 2013).

In early childhood, play and formal education are two mutually dependent aspects that form part of what constitutes quality in schools. Play is of fundamental importance at this stage of a child's life, since it is associated with learning and development (Pellegrini, 2011; Rubin, Fein, & Vandenberg, 1983; Smith & Hart, 2004). Consequently, one of the goals of early education is to enable children to play, offering them the resources they need to do so in positive, enjoyable and learning environments (Fisher, Hirsh-Pasek, Golinkoff, Singer, & Berk, 2011). This inter-relationship is widely acknowledged in northern European countries such as Norway (Karila, 2012) or Iceland (Gunnarsdottir, 2014), where play is seen as the basis for early education.

However, most of the research conducted in schools has focused exclusively on the classroom, and very few studies have examined the relationship between play and other key variables of children's development with respect to their learning in the outdoor school

environment (Ernst, 2014). This is the starting point for the present study, which aims to examine the relationship between social play and involvement in the outdoor school environment.

The Outdoor School Environment: A Natural Context for Development and Learning

A considerable amount of research has clearly demonstrated the positive influence that outdoor activity can have on various aspects of child development (Moser & Martinsen 2010). For example, outdoor activity was found to promote children's social competence (Veiga et al., 2016), motor skills and physical health (Cosco, Moore, & Smith, 2014; Gray et al., 2015), and to reduce levels of aggressiveness and conflict by encouraging affiliative behavior (Blanchet-Cohen & Elliot, 2011; Ouvry, 2003). Some studies have found that outdoor activity has a positive effect on children's concentration (Mårtensson et al., 2009), imagination and creativity (Canning, 2010), while also fostering an appreciation of nature and of what can be learned from nature experiences (Klaar & Öhman, 2014).

In this context some authors argue that the design of the outdoor environment, the activities that take place there and the use that children make of it should be given greater weight both in the early childhood education curriculum and in the everyday functioning of schools (DeBord, Hestenes, Moore, Cosco, & McGinnis, 2005; Kos & Jerman 2013). Indeed, it is recommended that outdoor environments be more highly valued as precursors of pedagogical environments that facilitate play, learning and child development (Moser & Martinsen, 2010). Many researchers believe that optimal outdoor environments are those in which the design tests the psychomotor skills of the children, provides a stimulating environment with different types and levels of challenges, is closely connected with the natural environment, and allows easy access (MacQuarrie, Nugent, & Warden, 2015; Moore, 2014). It is also stressed that the outdoor environment should be designed in such a way that children can experience it in many different

ways and take reasonable risks during their play activity, thus leading them to perceive the environment as stimulating and challenging (Little, Sandseter, & Wyver, 2012).

Social Play and the Outdoor School Environment

Play is a major activity of many children in most cultural communities around the world (Roopnarine, 2011). Play is a key element in child development since it demands learning, the development of linguistic, cognitive and motor skills, and social competence (Pellegrini, 2011; Rubin, et al., 1983; Smith & Hart, 2004). Children's play has been classified on the basis of their cognitive development (Piaget, 1962; Smilansky, 1968), as well as in relation to social maturity (Parten, 1932). Early childhood education and, consequently, outdoor school environments are social contexts for play, and as this may often include interaction with peers there is an opportunity to examine what is known as social play (Coplan, Rubin, & Findlay, 2006).

Social play in early childhood. The development of social play is a complex phenomenon involving the interaction of individual factors (e.g., sociability, emotional regulation, communicative skills), dyadic and group processes (relationships with caregivers and peers) and dimensions of the social context (cultural community, social and emotional climate of the social setting of play) (Howes, 2011). What distinguishes social play from other kinds of play is, obviously, the fact that it requires the coordinated participation of different individuals and, thus, it provides a unique context for psychosocial development and for building socio-emotional resilience. Social play occurs when a child is motivated to engage other children in shared playful activities, is able to regulate emotional arousal, and possesses the skills required to initiate interactions with others such that his or her social overtures are responded to in kind (Coplan et al., 2006).

Social play has enormous potential and serves various functions in the context of child development. During the toddler and preschool developmental periods it is seen as a behavioral manifestation of social competence (Howes, 2011).

Various studies have highlighted that when children play together they have the opportunity to mutually adjust their behavior (Pellegrini, 2011). Similarly, this kind of play exposes them to other points of view, which they may then come to share, and in the process they can acquire more complex sets of values, knowledge and ways of interacting (Howes, 2011; Rubin et al., 1983). Through social play, children also share the symbolic meaning that is implicit to play, an aspect which requires cognitive and communicative skills for understanding and extending the meaning of what play entails (Howes, 2011).

These characteristics mean that the ability to engage in social play, in addition to the various non-social forms, is a good marker of psychosocial adjustment in young children (Coplan et al., 2006). In fact, a lack of social interaction in childhood, characterized by highly reticent behavior on the part of the child, has been associated with social isolation, shyness (as a trait that hampers social interaction) and social anxiety (Rubin, Coplan, & Bowker, 2009), all of which, in turn, are predictors of socio-emotional difficulties and problems of school adjustment (Coplan, Ooi, Rose-Krasnor, & Nocita, 2014).

Categories of social participation in play. Children's social participation in play is generally classified into the categories of unoccupied play, solitary play, onlooker play, parallel play, associative play and cooperative play (Parten, 1932). Taking this categorization as a reference, Rubin (2001) classifies social play into three categories: solitary play, parallel play and group play. These categories comprise various kinds of play that differ in terms of their cognitive complexity. Group play in this case includes associative and cooperative play and is

assumed to reflect the highest degree of social participation. A number of studies indicate that children are more likely to participate in the categories of play that involve greater social participation as they get older (Pellegrini, 1992). Also, Rubin (2001) notes that during the preschool stage, parallel play prevails among children between two and a half and three and a half years of age, while among children aged three and a half to four and a half, associative play is more common.

Social play in the outdoor school environment. It is important to note that most published research concerns social play within the classroom, and very few studies have focused on the outdoor school environment (Ernst, 2014; Veiga et al., 2016). In terms of differences between the indoor and outdoor environments regarding the type of play that children engage in, research has generally found that the outdoor school environment encourages as much if not more social play than does the indoor setting (Bar-Haim & Bart, 2006; Hartle, 1996; Henniger, 1985; Shim, Herwig, & Shelley, 2001), and that the play which takes place outside positively complements what is learnt indoors (Hart, 1993). For example, Shim et al. (2001) reported that activities performed in the outdoor school environment were more likely to involve social interaction and included more complex forms of peer play.

Henniger (1985), for his part, found differences in preschool children's indoor and outdoor social play. Specifically, he observed more solitary activity indoors and more parallel play outdoors. Solitary play occurs when a child plays alone, quietly exploring or constructing in his or her social environment (Coplan & Ooi, 2014). This term is used to describe the display of solitary-functional and solitary-dramatic behaviors in the presence of peers. Solitary-functional behavior is characterized by repetitive sensorimotor actions, both with and without objects (e.g.,

skipping, banging blocks), while solitary-dramatic behavior involves engagement in pretense while playing alone (e.g., playing make-believe) (Coplan & Ooi, 2014).

Conversely, it should be noted that there is also some preliminary evidence to suggest that solitary-active play occurs more frequently during outdoor free play as opposed to indoors (Bar-Haim & Bart, 2006). Although this type of play has been associated with impulsivity (Coplan & Rubin, 1998), reticent behaviors, less social play, lower peer acceptance (Nelson, Hart, & Evans, 2008), and poorer motor skills and sensory reactivity (Bar-Haim & Bart, 2006), it has been suggested that it does not constitute a maladaptive behavior in the outdoor environment (Spinrad et al., 2004). It is argued that this is because the outdoor environment offers more opportunities for solitary-functional activities (e.g., running, sliding, climbing) and these are not perceived negatively by the peer group (Spinrad et al., 2004).

Some studies focusing on gender differences in social play have found that from the age of two years, boys and girls show clear preferences for companions of the same gender and spend more and more time in groups self-organized by gender (Andrews, Hanish, Fabes, & Martin, 2014; Ruble, Martin, & Berenbaum. 2006). Additionally, with respect to open-air settings, boys tend to gather in larger, more open areas to play in larger groups, where they are both farther away from adults and, at the same time, more public or visible. Their play here also involves more physical contact and fighting, and reveals a greater social hierarchy (Davidsson, 2006). By contrast, play among girls is typically carried out in small groups, in more intimate settings and closer to adults, with agreed-upon turns for involvement and more interactive conversations (Pillitteri, 2009).

The Concept of Involvement in Play Research

In addition to the outdoor school environment and social play, the third focus of the present study is involvement. In our view, the construct of involvement developed by Laevers (1994) offers a theoretical structure that is flexible enough to enable the quality of children's activity to be evaluated. Involvement refers to a process in the learner. This variable is generated by the learning environment and provides direct feedback about the impact of a teacher's interventions, since it describes qualities that can be observed in the child while teaching is taking place (Laevers & Heylen, 2003). According to Laevers (1994, 2005), children with a high level of involvement are highly concentrated and absorbed by their activity. They show interest, motivation and an intense and fascinated attitude, and hence they tend to persevere. Their gestures and posture indicate intense mental activity and they fully experience sensations and meanings.

Although the concept of involvement refers to a dimension of human activity it is not linked to specific types of behavior or to specific levels of development (Laevers, 2003); in fact, it has more in common with the notion of "state of flow" proposed by Csikszentmihalyi (1997). Given that the primary activity of the child in the outdoor school environment is fundamentally play, then high-involvement play would also include a considerable amount of exploratory activity that requires the child to be immersed in the action that he or she is performing, and to function to the best of his or her capabilities. Through such play the child may have a profound and motivating educational experience. Laevers (1994) argues that these characteristics mean that involvement and emotional wellbeing can give a fair idea about the likelihood of positive personal, socio-emotional and cognitive development in the learner. These two aspects can therefore be regarded as key indicators for assessing the quality and effectiveness of learning in

early education, hence the value of creating learning environments that promote them (Laevers & Heylen, 2003).

It should be noted that previous studies which have examined levels of involvement from this perspective have been conducted in the indoor school environment, primarily in relation to activities that could be considered academic and closely related to school routine, with little attention being paid to possible gender differences (Woods, 2016). The findings suggest that wellbeing and emotional security in the child, sensitivity on the part of the teacher, or a close child-teacher relationship characterized by a high degree of warmth and openness are associated with higher levels of involvement among children (Barandiaran, Muela, López de Arana, Larrea, & Vitoria, 2015). Conversely, discordant and coercive interactions between child and teacher, as well as a child's overdependence on the teacher, have been linked to low levels of involvement (Barandiaran et al., 2015; Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012; Ebbeck et al., 2012).

Among those classroom-based studies that have considered gender, Ulich and Mayr (2002) found that although overall levels of involvement were similar among boys and girls, there were substantial differences in terms of their activity preferences. Specifically, they found that boys showed greater involvement than girls in physical play, sand and water play, hammering and wood work, when using technical instruments, and when playing with discovery tables or construction material. Girls, by contrast, showed higher rates of involvement in molding and modeling; board and card games; role play; scissoring; gluing and folding; puzzles and work sheets; and listening to music.

The Present Study

The literature review set out so far in this introduction suggests that an optimal outdoor school environment activity is associated with greater social competence, motor skills, and physical health, and has a positive effect on children's concentration, imagination, and creativity (Moser & Martinsen, 2010). It is also worth mentioning that the high quality of an outdoor school environment has been found to be associated with interaction with nature and to be characterized by play situations, learning and interactions that encourage the participation and personal initiative of the child (Canning, 2010; Moser & Martinsen 2010).

One of the ways to evaluate the effect that the quality of the outdoor school environment has on child development is to focus on play and to examine its relationship with involvement. However, most research that has taken this perspective has been limited to the indoor classroom setting, and very few studies have examined the relationship between play and involvement in the outdoor school environment. Furthermore, there has been little research examining the relationship between play and involvement in the outdoor school environment from the point of view of gender. In this respect, there are many issues that remain to be clarified, such as whether there are gender differences in children's involvement in activities taking place in the outdoor school environment, and whether gender moderates the relationship between play and involvement.

In light of the above, the primary purpose of the present study was to examine the relationship between the type of social play in the outdoor school environment and involvement. We hypothesized that greater social play activity (solitary, parallel or group) would be associated with greater involvement, and that children who show greater group play activity would show greater involvement than would children who engage more in solitary or parallel play. We did not expect to find gender differences in involvement in the outdoor school environment, nor did

we expect to find any moderating effect of gender on the relationship between the type of social play and involvement.

Method

Participants

The participants in the present study were 173 children (87 girls, 50.3%; 86 boys, 49.7%) between 3 and 6 years of age (M_{age} = 3.95; *SD* = 0.82) who were attending a total of 19 preschools in the Basque Country (Spain). Fifty-one teachers (50 women, 1 man) also participated. Class sizes ranged between 21 and 25 children and the staff/child ratio was 1:24. Children spent five hours per day in class and 30 minutes per day outside in the school playground. Both the children and the teachers were selected based on their availability. Written informed consent was obtained from all the children's parents, as well as from the teachers and the school management. This research was carried out in accordance with the current ethical standards established by the authors' universities.

Procedure

The present research was carried out in several steps. First, the research project was presented to various schools in the Basque Country. Once informed consent for participation had been obtained from the school heads, the teaching staff and the children's legal guardians the quality of the outdoor school environment was assessed using the POEMS. The outdoor environments analyzed met the minimum requirements established by the Spanish Ministry of Education. They all covered an area of at least 150 m^2 (*M* = 189.5; *SD* = 15.82) and they were used by children in accordance with an agreed timetable that separated children of different ages.

Next, the children's free play in the outdoor school environment was recorded. Play observations were carried out over a period of three months, from April through to the third

week of June. On each day of observation we selected four children and made recordings lasting 24 minutes. The researchers had a different list of randomized children to film individually for 6 minutes, with each child being filmed on a single day. Although the recording focused on the selected child the other children from his/her class who had attended school on that day were also present in the playground. A number of strategies were employed to control for the effect of certain variables: we chose days on which the weather was similar (no rain; temperature between 14 and 18 °C); recordings were made at the same time of day (11:00-11:30); the children spent the same amount of time in the classroom (5 hours) and outdoors (30 minutes); and we ensured a similar teacher/child ratio (1:24) and overall group size (21-25 children). Finally, the recordings were viewed and evaluated using the POS and LIS-YC.

Measures

The Preschool Outdoor Environment Measurement Scale (POEMS). As its name suggests, the POEMS (DeBord et al., 2005) is a scale that measures the quality of the outdoor environment of preschools. The lay-out and use of a school's outdoor environment was examined through observations of children and teachers outdoors. The observation period required by the scale was 45 to 60 minutes. The information gathered through observation was complemented by interviews with teaching staff. The POEMS consists of 56 binary-choice items grouped into 5 domains: (1) Physical Environment, (2) Interactions, (3) Play and Learning Settings, (4) Program, and (5) Teacher/Caregiver Role. The first domain, Physical Environment, refers to the quality of the physical characteristics of the preschool outdoor environment. A high-quality physical environment is one designed in such a way that children are able to try out their skills in a setting that offers various types and levels of developmental challenges and

stimulation, all of which must be easily accessible and closely linked to nature. The physical environment should arouse children's curiosity, fostering their understanding of reality, stimulating their imagination, inviting exploration, communicating a sense of belonging and cultural identity, and promoting the development of competencies. The location of the outdoor play environment is particularly important, namely it should be well away from risks to children's safety (e.g., roads) and health (e.g., dust, smoke). The second domain, Interactions, refers to the extent to which the outdoor environment encourages children to interact with it. For example, a high-quality environment might contain leaves, flowers or twigs, etc.; promote child-to-child interactions through the presence of two-person benches or objects such as a puppet theatre; enable teacher-child interactions during playtime (e.g., facilitation of activities, fostering inquisitiveness); and allow for parent-child interactions (e.g., adequate outdoor seating). The third domain, Play and Learning Settings, refers to the organization of the outdoor play and learning space and the materials available within it. Thus, a high-quality setting would include distinct spaces that promote specific experiences or activities around a common theme (e.g., active play zone, storytelling corner, an area for sand and water play, a kitchen garden, etc.) and which use good-quality natural or manufactured materials, including materials or objects that can be moved around (pine cones, smooth stones, toys for sand play) depending on their relevance to a given activity and zone. The fourth domain, Program, refers to the integration of the outdoor space within the curriculum. Thus, a high-quality program is one that considers outdoor activity as an extension of classroom-based work, and regards it as an important part of the curriculum. In other words, there is explicit recognition that children's development and learning can also take place in an outdoor space that is designed to maximize their learning opportunities (investigation, exploration, physical activity and spontaneous movement, social interactions,

promotion of language development, negotiation and cooperation, experiences with various materials, etc.). The fifth and final domain, Teacher/Caregiver Role, refers to the extent to which the educational community (teachers, families and community resources) seeks to promote high-quality outdoor spaces. It also alludes to the pedagogical style of the teacher/caregiver. High quality here would entail consideration of the outdoor environment as an educational resource that needs the support and participation of teachers, families and other members of the community. In addition, the teacher/caregiver would ideally adopt an involved and interactive role that includes suggesting ways of organizing outdoor learning spaces while ensuring children's safety, but without this involvement becoming intrusive, critical, normalizing or limiting of children's creative learning opportunities.

When using the POEMS the task for the observer is to check whether or not each item is present, and this was the first step in our study. Then, once all the POEMS data had been gathered, we calculated the percentage value of each domain on a scale ranging from 0 to 100 points. The overall mean percentage was then interpreted as follows: 30 or less, very low quality environment; 31-41, low quality; 42-60, medium quality; 61-70, high quality; and 70 or above, very high quality. The POEMS offers appropriate internal consistency, content validity and concurrent validity (DeBord et al., 2005). In the present sample, Cronbach's α was .84. The Cronbach alphas for each of the domains (factors) were .72, .78, .76, .63 and .71 for Physical Environment, Interactions, Play and Learning Settings, Program, and Teacher/Caregiver Role, respectively.

The 19 playgrounds were coded by two raters, both experts in early childhood education. Inter-observer agreement achieved a coefficient (Spearman correlation) of .91.

The Play Observation Scale (POS). The POS (Rubin, 2001) is a tool that measures the social participation and cognitive quality of preschool children's play. It has proved useful in determining age and gender differences in children's play, socioeconomic status differences in play, effects of the ecological setting of play, individual differences in play, and the social contexts within which the various forms of cognitive play are distributed (Fromberg & Berger, 2015). For the purposes of the present study we recorded the free play of each child in the outdoor school environment. The assessment of social participation was carried out by viewing the video recordings. Ten-second intervals were coded for social participation (six variables: unoccupied, onlooking, solitary play, parallel play, peer conversation, and group play) and the cognitive quality of play (five variables: functional, dramatic, and constructive play; exploration; games with rules), resulting in 36 coding intervals per child over the total observation period of six minutes. The 11 variables can be defined briefly as follows: Unoccupied behavior implies a complete lack of goal or focus; onlooking is when a child watches (or listens to) the behaviors and activities of other children; solitary play is when a child engages in an activity entirely alone; parallel play implies engagement in an activity alongside (but not together with) other children; group play involves engagement in an activity together with another child or children, in which the cognitive goal or purpose is shared amongst all group members; the goal of functional play is to experience sensory stimulation through simple, repetitive muscular movements; the aim of constructive play and exploration, respectively, to create or construct something and to obtain visual or auditory information from an object; finally, games with rules imply engagement in a competitive game-type activity following pre-established rules and limits (Rubin, 2001). A training period was required on recorder use by the two observers, both experts in early childhood education.

A time code superimposed on each videotape in conjunction with a remotely controlled tape-stop device allowed observers to view tapes at 10-s intervals. Intra-observer and inter-observer agreement achieved coefficients (Cohen's kappa) of .92 and .89, respectively. This calculation was based on the 30% of videos that were double-coded.

Leuven Involvement Scale for Young Children (LIS-YC). The LIS-YC (Laevers, 1994; 2005) evaluates the degree of a child's involvement in a given activity. The assessment of involvement was carried out by viewing the recordings of the children's free play in the outdoor school environment. A total of 6 intervals, each lasting one minute, were coded per child, and in each sequence the child's level of involvement was rated on a scale from 1 to 5. The five scale ratings are: (1) Extremely low involvement: The child hardly shows any activity; (2) Low involvement: The child shows some degree of activity, but this is often interrupted; (3) Moderate involvement: The child is busy the whole time, but without real concentration; (4) High involvement: There are clear signs of involvement, but these are not always present to their full extent; and (5) Extremely high involvement: During the episode of observation the child is continuously engaged in the activity and completely absorbed in it.

The average value of each set of 6 observations was obtained: the lower the score, the lesser the involvement, and vice-versa. A concordance analysis was carried out between two observers (for 30% of the videos), both experts in early childhood education, yielding a mean intraclass correlation coefficient (two mixed effects factors, absolute agreement) of .85.

Data Analysis

The first step involved a descriptive analysis of the outdoor school environment. Second, a bivariate correlation analysis was carried out to explore the relationships among the different variables in the study. The Pearson correlation coefficient was calculated in all cases, except

when the variable was dichotomous (gender), in which case the point-biserial correlation coefficient was used. Third, and given that the data structure implied two levels of analysis, that is, children (level 1) grouped within playgrounds (level 2), we used hierarchical linear models in order to estimate cross-level relationships in the nested data structure (Heck & Thomas, 2015).

Analyses were performed using the MIXED procedure in SPSS v23.

Results

Descriptive Analysis of the Outdoor School Environment

Table 1 shows the mean scores and standard deviations obtained for the quality of the outdoor environment of the preschools, as measured by the POEMS.

Insert Table 1 here

The overall mean quality rating of the schools' outdoor environments was moderate (60.47%). High ratings were achieved in the Physical Environment and Interactions domains, whereas scores for the other domains indicated a medium quality. It should be noted that the score for Teacher/Caregiver Role was slightly above what would be required to consider an outdoor environment as being of sufficient quality.

The design of the outdoor environments was generally geared toward the main sports played, such that soccer pitches or basketball courts (68%) predominated. In fact, in many of the environments, sports were the only type of activity possible. Indeed, we often observed a large group of children, mostly boys, playing soccer and taking up most of the playground, thus forcing the remaining boys and girls to play in less appealing areas, with hardly any resources available for alternative games. Few of the playgrounds offered other play equipment such as jump ropes (55.6%) or nets (5.6%). Furthermore, only rarely did we find complementary

equipment that could respond to the diverse interests of boys and girls, such as sand play (5.6%) or drawing (5.6%). When such complementary equipment was available it was sometimes difficult for the children to access (50%), thus hampering their autonomous use of it. The playgrounds analyzed were thus a long way from what one might consider a natural environment for learning (16.7%), that is, a place where children can play and learn by engaging with and manipulating a range of natural elements, materials, organisms, and habitats through sensory, fine motor and gross motor experiences. Overall, there were low levels of environmental diversity, natural elements, and contact with nature.

With respect to the use of the outdoor school environment, there were limits in both time (30 minutes break time) and space (restricted to the playground), and children only infrequently made use of some other resources that were available in the public space.

When interviewed, teachers tended to give a poor rating of the pedagogical content of the outdoor environment. In general, they saw the playground as a place where children could run around, tire themselves out and let off steam. For many teachers, the time children spent outside was a period of rest from what "really matters", that is, the syllabus-based learning that takes place in the classroom. Consequently, they saw little of educational value in the outdoor environment and regarded their role there as supervising the children and offering help when needed, such as when a child falls over, asks for help or needs comforting. Consistent with this, we did not observe teachers extending learning about the outdoors or modeling care of the environment. Neither did they appear to have a proactive attitude towards providing new resources that might enrich children's play.

Descriptive Statistics and Bivariate Correlation Analysis

Table 2 shows the mean scores and standard deviations obtained for the children with respect to type of social play and involvement, broken down by gender and age.

Insert Table 2 here

In the correlation analysis, involvement showed positive, statistically significant, small-magnitude correlations with parallel play ($r = .19$; $p < .05$) and moderate-magnitude correlations with group play ($r = .49$; $p < .01$); group play showed negative, statistically significant, moderate-magnitude correlations with both solitary play and parallel play ($r = -.40$ and $r = -.48$, respectively; $p < .01$), and small-magnitude correlations with gender ($r = -.16$; $p < .05$).

Multilevel Analysis

In order to determine whether there were differences both between and within playgrounds with respect to the criterion variable 'involvement' we carried out a random effects one-way ANOVA. Using the variance in the 'playground' factor (0.03) and the variance of the residuals (0.44) we calculated the intra-class correlation coefficient (ICC). The value obtained (ICC = .06) indicates that of the total variance in the criterion variable, around 6% corresponds to the difference in means of the playgrounds, thus suggesting that children's involvement depends to a small extent on the playground in which they are playing.

In addition, the results of the null model suggested that a multilevel model was not appropriate, given that the intercept did not vary significantly between playgrounds (Wald $Z = 1.256$; $p > .05$). Therefore, and following the recommendations of Heck and Thomas (2015), we performed a hierarchical regression analysis with interaction terms in order to examine the

relationship between the type of social play and involvement. It should be noted that the variable "gender" was reclassified as a dummy variable, with the value 0 corresponding to boys (reference group) and 1 to girls. Likewise, the variable "age" was reclassified into two dummy variables whose reference group was boys in the 3-4-year-old age group.

Hierarchical Regression Analyses

In order to examine the effect of type of social play on involvement we carried out a series of hierarchical multiple regression analyses with interaction terms, in which gender, age and type of play were predictor variables, and involvement was a criterion variable. For each regression analysis, children's gender and age were entered in the first step, the main effects of solitary play, parallel play and group play were entered in the second step, and two-way interaction terms (solitary play x gender, parallel play x gender and group play x gender) were entered in the third, fourth and fifth step, consecutively. All necessary assumptions for carrying out the regression analysis were met. Both the histogram of residuals and the probability chart fell within normality, and application of the Breusch-Pagan test and Koenker's test revealed no heteroscedasticity problems. Additionally, we checked that the value of the variance inflation factor (VIF) and tolerance indices were within the recommended range.

The analysis revealed a statistically significant interaction between group play and gender, F (9,163) = 21.019 (p = .0001). The linear model that includes this interaction explains 53.7% of the variance in involvement. The results are shown in Table 3.

Insert Table 3 here

With respect to primary effects, no effect of gender or age group on involvement was found; hence, there were no differences in involvement between boys and girls, or among children of different ages. The results demonstrate that solitary play (β = .209, t = 2.732, p = .007), parallel play (β = .535, t = 5.269, p = .0001) and group play (β = .756, t = 7.530, p = .0001) all predict involvement. Thus, as might be expected, the greater the frequency of solitary, parallel or group play, the greater the child's involvement. More specifically, our analysis of the regression coefficients demonstrates that group play accounts for more of the variance in predictive ability than does either solitary play or parallel play.

With respect to interaction effects (Fig. 1), we found that gender modulates the relationship between group play and involvement (β = .280, t = 2.061, p = .041). Specifically, although a higher frequency of group play was found to predict greater involvement by both boys and girls, in the case of girls the more frequent the group play, the greater the positive effect of that play on involvement.

Insert Figure 1 here

Discussion

The Design and Use of Outdoor Environments

The primary purpose of the present study was to examine the relationship between type of social play and involvement in the outdoor school environment. With respect to the design of outdoor environments, our results clearly demonstrated that the environments analyzed fell far short of fulfilling the criteria for high quality suggested by various experts (Kos & Jerman, 2013; Luchs & Fikus, 2013). In general, we found that the design and use of outdoor environments were undervalued aspects in the educational curriculum, and consequently such environments were

underused. Additionally, the possibilities for play were quite limited, not least as the environments were geared predominantly to the practice of certain sports, offering little contact with nature. Generally speaking, therefore, what predominated were physical activities such as soccer, running and jumping around the playground, and games involving chase. Talking with peers and observing the behavior of other children were also common activities. In this regard, we believe that schools in our geographical area must make improvements in order to create high-quality outdoor environments that have a positive effect on child development and learning. With the exception of Scandinavian countries, such as Norway, Denmark and Sweden (Kos & Jerman, 2013; Little et al., 2012; Williams-Siegfredsen, 2012), and certain schools in the UK (O'Brien, 2009) and Australia (Elliot & Chancellor, 2014), the situation appears to be similar both in other European countries (Kos & Jerman, 2013) and elsewhere in the world (Chancellor & Cevher-Kalburan, 2014; Ernst, 2014; Hu, Li, De Marco, & Chen, 2014; Ihmeideh & Al-Qaryouti, 2016; McClintic & Petty, 2015; Shim et al., 2001), although it should be noted that the number of studies conducted is small. This highlights the need not only for further research into the quality of the outdoor school environment, but also for initiatives that enable the outdoors to be used to full potential.

Relationship between Social Play and Involvement in the Outdoor School Environment

With respect to the relationship between social play and involvement in the outdoor school environment, we found, as expected, that greater social play predicts greater involvement on the part of the child. Furthermore, the children who engaged in more group play showed greater involvement than did those who engaged more in solitary or parallel play. This is consistent with the results of other studies that have found an association between greater social play and better

results on scales that measure variables related to the learning and development of preschool children (Coplan et al., 2014; Coplan, Wichmann, & Lagacé-Séguin, 2009; Veiga et al., 2016).

Thus, it can be stated that in the outdoor school environment, children become more involved as more social participation is required by the type of play, with group play being the type that predicts the greatest involvement. Given, therefore, that involvement, together with emotional wellbeing, is a key indicator for assessing quality and the effectiveness of learning in early education (Laevers & Heylen, 2003), we believe that the design of preschool outdoor environments should be geared toward encouraging social participation, especially in the form of group play. More specifically, however, developments of this kind must not only seek to promote children's contact with nature but should also be based on the concept of affordance (Gibson & Pick, 2000). This concept refers to those properties of the physical environment that stimulate, attract and support the actions of individuals. It should be noted that affordance is present if the child perceives and acknowledges an opportunity and if the environment is tailored to the child's stage of development; in this respect, the environment and the individual are considered to form part of an interactive system. As Cosco (2007) says, "an object in the play area will be considered *clim-able* if it is possible to climb on it, *slide-able* if it allows sliding, or *swing-able* if one can swing on it" (p. 128). Thus, the environment must be designed in such a way that it affords the possibility of play. For example, two children of preschool age may use some sand, earth, water, grass, twigs and stones to build a stable, and might then place some pressed leaves of different sizes and colors inside to represent the farm animals. The next day they return to the same play area and this time they are joined by other children who are drawn towards the play. The new children join in and cooperate with the activity, adding new ideas about how the farm works (who arrives, who leaves, etc.) and what the animals do (when they

eat and sleep, etc.); they also, of course, bring their own emotions and problem-solving skills. This, then, is an example of group social play that promotes involvement and emotional wellbeing, and which would not have taken place without the combined affordances of elements such as earth, water, grass, leaves and stones, as well as the staging created by the children's own imagination.

Gender Differences in Involvement in the Outdoor School Environment

With respect to gender differences examined in the present study, there were, as expected, no differences between boys and girls in levels of involvement in the outdoor school environment. This is consistent with results obtained in studies carried out in German classrooms (Ulich & Mayr, 2002). However, gender was found to have a moderating effect on the relationship between the type of group play and involvement. Our results showed that in both boys and girls, group play predicts greater involvement. However, although the frequency of group play was lower among girls than boys, among girls the greater the frequency of this type of play, the greater its positive effect on involvement.

One possible explanation for this result relates to the typical set-up of the outdoor school environment. As mentioned above, the design of the outdoor environments we analyzed was geared toward the main sports activities, those most commonly played by boys. By designing the space in this way, girls' outdoor play is restricted to a narrower range of activities in a much smaller environment, one that may not be very stimulating. This may make it difficult for them to initiate group play, thereby encouraging more solitary and parallel play. Bearing in mind the importance of group play for child development, this tentative explanation leads us again to propose changes in the design of the outdoor school environment. We believe that these environments should promote gender equality and the inclusion of both boys and girls, and

consequently they should be designed in such a way as to offer both access to a natural environment and multiple diverse opportunities for play and learning (DeBord et al., 2005; Moser & Martinsen, 2010). Outdoor school environments of this kind would be better able to promote the social participation of all girls and all boys, and would represent a move away from designs that favor the most common sports activities, those which are generally associated with the male gender.

Limitations and Future Research

The present study does have certain limitations. First, the results obtained would have greater external validity if they were replicated with larger samples, including outdoor environments with more heterogeneous designs. This would also enable us to examine the effect that the quality of the outdoor environment has on social play and children's level of involvement. In addition, it would be of particular interest to carry out a transcultural study in which the relationship between social play and involvement were analyzed in countries where the use and design of outdoor environments are noticeably different. A further potential limitation considers the observational nature of the data. Although an observational approach is considered to be methodologically appropriate for the study of children's social behavior, there are no clear guidelines regarding the necessary frequency and duration of observations (Fabes, Martin, & Hanish, 2009). Thus, although we believe that the number of observations performed in our study was sufficient given the target variables, future research should aim to increase the frequency and duration of the observations made. Likewise, the present objectives and hypotheses would also benefit from a longitudinal design so that participants could be followed up throughout their preschool and even primary education. Given that a higher frequency of group play is associated with greater involvement, it would also be interesting in future research

to examine the effect of the different subtypes of group play (i.e., associative and cooperative) on this relationship. Finally, given that the quality of the relationship between teachers and children in the classroom is a variable that affects involvement (Barandiaran et al., 2015) it would be useful in future studies to examine the effect that the teacher's role and attitudes have on children's involvement in the outdoor environment. We believe that studies of this kind would help to draw attention to the need for teachers to receive training as regards the importance of the outdoor environment for children's development.

Implications for Practice and Policy

Despite these limitations the results obtained here allow us to endorse the importance of the outdoor school environment for children's development. The findings also highlight the underlying need in our geographical area to implement innovation projects in schools that specifically address the outdoor environment. These changes require the participation of all parties, including children themselves, their families and the community. We also believe that it is vital that any such initiatives receive government support in the form of inclusive education policies that promote the development of all children (Urban, 2012). Furthermore, initiatives of this kind should not be based exclusively on curricular considerations related to teaching and learning, but rather should take their lead from the need to promote children's well-being and gender equality, thereby contributing to the creation of a fairer and more equitable society.

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Table 1. Mean scores and standard deviations for the quality of the outdoor environment

Domain	*Mean*	*SD*	Mean of percentages (range 0-100)	SD of percentages	N
Physical Environment (range 0-13)	10.21	2.84	78.54	21.84	19
Interactions (range 0-13)	9.89	2.88	76.11	22.19	19
Play and Learning Settings (range 0-13)	7	2.33	53.85	17.95	19
Program (range 0-9)	4.42	1.35	49.12	14.96	19
Teacher/Caregiver Role (range 0-9)	3.58	1.68	44.74	20.96	19
Total			60.47	16.65	19

Table 2. Mean scores and standard deviations for social participation and involvement

	Gender				Age group					
	Girls (*n*=87)		Boys (*n*=86)		3-4 years (*n*=62)		4-5 years (*n*=58)		5-6 years (*n*=53)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Unoccupied	1.38	3.08	1.17	1.90	1.39	2.60	1.00	1.63	1.45	3.26
Onlooking	3.56	4.29	3.06	3.91	3.48	4.17	2.98	3.70	3.47	4.47
Solitary play	1.91	2.90	2.78	4.98	3.13	4.49	1.72	3.23	2.09	4.33
Parallel play	2.99	7.58	2.47	6.43	4.73	8.94	1.47	4.98	1.77	5.86
Group play	14.54	9.53	17.83	11.16	14.02	11.20	17.36	9.12	17.40	10.77
Peer conversation	8.20	6.32	6.09	5.50	5.95	5.35	8.26	6.26	7.34	6.27
Involvement	3.33	0.77	3.48	0.58	3.45	0.68	3.36	0.67	3.39	0.72

Table 3. Regression analysis taking type of play, gender and age as predictor variables, and involvement as a criterion variable

Standard regression coefficients (β) (n = 173)					
Predictor variables	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	-.112	.036	.040	.038	-.256
Age group: 4-5 years	-.061	-.014	-.014	-.014	-.018
Age group: 5-6 years	-.041	-.019	-.021	-.020	-.009
Solitary play		.269**	.273**	.273**	.209**
Parallel play		.625**	.625**	.618**	.535**
Group play		.903**	.903**	.902**	.756**
Solitary play x Gender			-.009	-.009	.062
Parallel play x Gender				.008	.126
Group play x Gender					.280*
R^2 (proportion of variance accounted for)	.015	.525	.525	.525	.537
Added value		.510**	0	0	.012*

*$p < .05$; **$p < .01$.

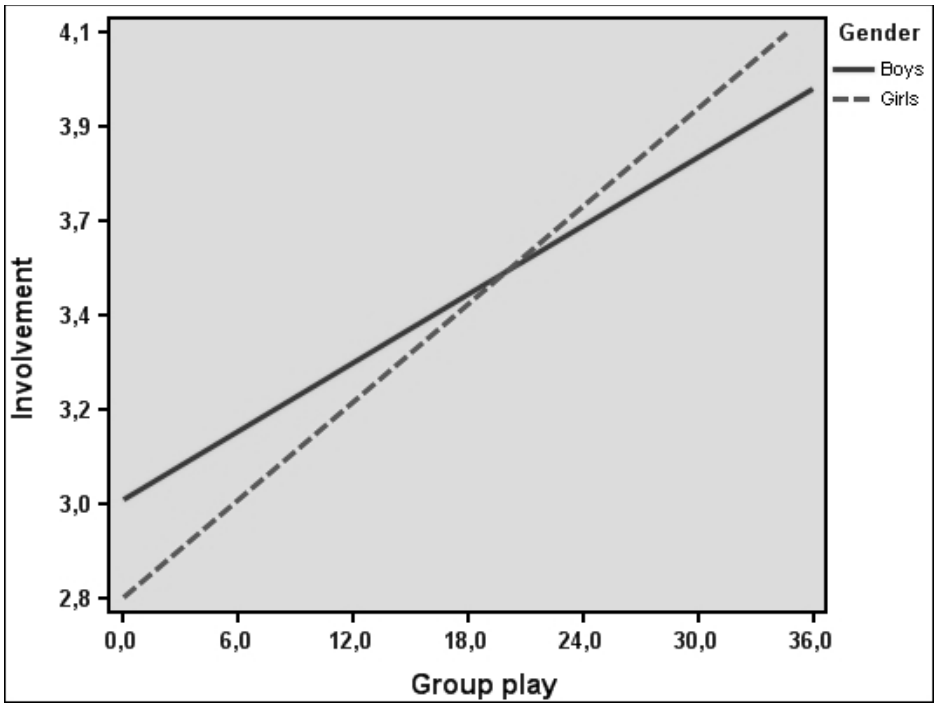

Figure 1. Interaction between group play and gender with respect to involvement. Level of involvement was rated on a scale from 1 to 5. The frequencies for group play ranged between 0 and 36.