

Full Length Research paper

The influence of play in motor, cognitive and social performance in school-age children

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Play behavior is a spontaneous and enduring activity in school-aged children. While play is a highly valued developmental and learning asset by adults in care during infancy and preschool years, free play times are constrained in the majority of primary school settings. The present study conducted a quasi-experiment with a pre-post test design aimed to verify the influence of free play times at school in the motor, cognitive and social performance of Brazilian and Portuguese children in their second school year. 44 children (23 Brazilian and 21 Portuguese) were randomly distributed into a control group and an experimental group. Children in the experimental condition were introduced twice a week during three months to sessions of free play at their schools. Evaluations at the pre and post tests were performed individually or collectively in a classroom setting before and after the three month intervention. The intervention produced similar results in Brazilian and Portuguese children. The introduction of free play times in the school environment elicited significant changes in the cognitive, social and physical performances in both Brazilian and Portuguese children enrolled in the experimental condition. The benefits of including free play times in the school schedule were specifically pointed out in this study. Results suggested that this kind of activity is an activator for children's developmental process and is able to increment the results of educational practices.

Keywords: Children; cross-culture approach; development.

INTRODUCTION

Play behavior has been studied in academic psychology in order to characterize gender differences, identify relationships to health and development, and to elucidate its implications in children's learning processes. Overall, the research literature has shown that play has a fundamental role in children's development (Cordazzo et al., 2007; Cordazzo et al., 2010; Neves et al., 2011; Pellegrini, 2009; Pellegrini et al., 2007). During play children engage in activities that involve the expression of their personalities and learning characteristics.

In terms of definition, play behavior is characterized as an unstructured self-amusement activity that has a goal

in itself, and it can either be governed or not by prior rules (Brougère and Wajskop, 1997; Bomtempo, 1997; Biscoli, 2005). Also characterized as free play are the activities that include the child's voluntary decision, i.e., it is the child who decides when, how, where and, if necessary, with whom to play (Queiroz et al., 2006).

Play is the main activity in childhood. This statement is true not only by the frequency of which children play, but mainly by the influence it has on development. General milestones in children's development which are partly accounted to human ontogenesis, such as crawling, walking and talking, are related to the body and brain maturation (Papalia et al., 2006). However, besides individual differences another factor that produces advances and changes in maturity is the social and cultural conditions in which the child is placed (Vygotsky, 1998).

One example that shows how social conditions can

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elicit changes in children's development is when a child enters school. For society, entering school and learning to read and write are important indications that the child has advanced in his/her development. Usually, we consider a school-age child to be a child between 6 and 11 years-old (Papalia et al., 2006).

Individual physical differences among school-age children are evident. Papalia et al. (2006) claim that children at this age have a spurt in body growth. This growth is followed by intense physical activities, and the improvement of motor skills. Negrine (1994) discusses the need of school-age children to engage in intense physical activities while playing. More specifically, play behavior involving physical activity improves control of specific motor patterns and are thus an opportunity for strength and endurance training (Pellegrini and Smith, 1998).

Physical development addresses biological aspects related to growth, nutrition and movement. However, movement has features that go beyond biological or physiological aspects. Psychological aspects influence children's motor aspects as well, especially when we consider the intricate "relationship among neurological, motor and psychic functions" (Rosa Neto, 2002, p. 127). This same author claims that learning movements result in better use of psychological abilities. When motor aspects are developed they can give the child support to develop other skills, such as manual dexterity or playing sports. Using these skills can help to promote the participation of children in social groups through games, playing or other activities that demand motor skills and movement dexterity.

According to the social-cultural perspective, social aspects are the basis for human development (Vygotsky, 1998). When children reach school age, friends begin to have a significant importance (Almeida, 2000; Papalia et al., 2006). Within a play group, children can learn rules, behaviors, limits, and penalties to inappropriate attitudes. Children can also start making distinctions in terms of gender roles, which are imposed by society and culture (Silva et al., 2006).

Cultural transmission through play happens horizontally, from child to child (Pontes and Magalhães, 2003), and it helps to perpetuate social characteristics in later generations. This phenomenon occurs through learning and teaching mechanisms, and explains the universality of same characteristics in children's play.

A child who does not present a skillful conduct in the face of social demands may later show interpersonal deficits that will affect his or her physical, cognitive and emotional development. These deficits occur because a child who is shown not to be socially skilled can experience social restrictions, such as isolation, impoverished relationships, and discrimination (Del Prette

and Del Prette, 2002). In contrast, a child who is skillful in social contacts can have success in other aspects of development, including cognitive development (Blatchford, 1998).

Cognition can be characterized as the mental process through which knowledge is acquired. Processing information and organizing it for future uses are characteristics that identify human cognition. For Vygotsky (1998) skills are not only determined by congenital factors, but mainly they are the result of social and cultural activities. Moreover, genetic characteristics, combined with nutritional, emotional and environmental factors can cause the individual to have a greater or lesser aptitude for different tasks. Based on this information, we can consider that cognition is the ability to perform or plan an action through the use of knowledge and skills socially or genetically inherited or acquired through the five senses. The dimensions of cognitive development intersect at various times. Detecting a child's cognitive development is identifying which skills he or she already has and which ones are still under development.

In general, play and games are often less appraised in school contexts. Biscoli (2005) has argued that studies about play are generally conducted with younger children, such as babies and preschoolers. Cordazzo et al. (2007) claimed that it is difficult to find experimental researches that clearly show the influence of play in children's development and learning. Bomtempo (1997) found out that adults, including teachers, cannot see play as something necessary to children's development. Hence, they give more attention to the study and accumulation of scholastic knowledge, even though play is shown to be directly related to learning.

This study aims at discussing the role of play as a facilitator in the process of human development. To this goal, the study examined what were the effects on motor, cognitive, and social development for Brazilian and Portuguese children of maximizing free play times at school through the implementation of 30 minute play sessions twice a week. Our intention was to verify the efficiency of the experiment and it did not aim a comparison between Brazilian and Portuguese children. Moreover, as the study was carried out in different countries it was not possible to apply the same instruments because of scientific limitations, since it was not recommend to use psychological tests that were not validated to a specific population. The tests used in Brazil were not yet validated in Portugal and vice-versa.

We hypothesized that the implementation of free play times in school would have a positive influence in children. In the present study, the experiment was conducted in two elementary schools in the two countries. One school was located in the south of Brazil

and the other in the north of Portugal. Assuming that the school-age children have a strong motivation to play, this study aimed to characterize and compare the play of school-age children in two cultural contexts that are most similar in terms of socio-historical matrix. It is important to consider that both countries have a historical link that binds them together and to take into consideration the significant Portuguese influence and cultural heritage in southern Brazil. The intersection of influence in both the past and the present leads us to expect this study to detect the similarities and differences in the practices of play in child development stages marked by intensive processes of socialization among peers. Data comparison enriches the research because the differences and similarities found in the influence of play in children's development in two contexts can be pointed out. Furthermore, results of this study can help in training professionals who work with human development, such as teachers and psychologists.

METHOD

The present study is a quasi-experiment because it has characteristics of an experiment, but there is no control of all variables (Bryman, 1989). Randomization was ensured, however the sample under study is not meant to be considered as representative of Brazilian and Portuguese populations. Pre and post test evaluations were conducted prior and after the experiment to children in both the control and the experimental conditions.

Participants

In this study, 44 children participated in the experiment in their schools. These children were attending the second grade in elementary schools in the south of Brazil and in the north of Portugal. In both countries, children were randomly divided by lottery into two groups, Control and Experimental. In Brazil, among the 23 children who participated ($M=7.6$ years old $SD=0.4$), 12 enrolled in the control group (7 boys and 5 girls) and 11 in the experimental group (7 boys and 4 girls). Participants in Portugal were 21 children ($M=7.5$ years old $SD=0.4$), 10 in the control group (6 boys and 4 girls) and 11 in the experimental group (7 boys and 4 girls).

Brazilian children were recruited from a private school in Florianópolis, the capital of the Southern state of Santa Catarina. The school population amounted to 700 children ranging from low-middle to middle-class families. Portuguese children, in turn, attended an urban public school in Braga (located in the North of Portugal and the third major city in the country), which had 200 children

from low-middle-class families.

Instruments

The psychological measures used for assessing the children's motor, social and cognitive skills were tests validated in each country in order to increase the cultural adaptation of the psychological testing in Brazil and Portugal. Therefore, measures administered in Brazil were:

- Motor Development Scale – EDM (Rosa Neto, 2002).

This scale allows assessing motor development through measures of fine and gross motor, equilibrium, physical scheme, temporal and space organization, and laterality. The administering of scale was performed individually. The score of general motor quotient (GMC) was used, which is obtained by dividing the sum of the motor test results by the child's age, and then multiplying by 100.

- Multimedia Inventory of Children's Social Skills – IMHSC-Del-Prette (Del Prette and Del Prette, 2005).

IMHSC-Del-Prette assesses 7 to 12 years-old children's social skills through self evaluation. It is a digital material with 21 items on social interaction. This inventory was developed and standardized to Brazilian samples. This scale was applied collectively.

- Draw-A-Person Test – DFHIII (Wechsler, 2003).

This scale assesses children's cognitive development through drawings. Draw-A-Person test was validated and standardized to Brazilian children between 5 and 12 years-old. This test was applied collectively. Children should draw two human figures, one male and one female.

In Portugal, the Griffiths Mental Development Scales – GMDS, version to 4 to 8 years old (Castro and Gomes, 1996) were administered.

- Griffiths Mental Development Scales, version to 4 to 8 years old – GMDS (Castro and Gomes, 1996)

These scales assesses the rate of children's development within an age range of four to 8 years old. The GMDS assesses, individually and collectively, six areas of development. The scales can be used separately as well. In this study, only the subscales that had similar characteristics to the ones used in Brazil were administered. Subscales used were: Locomotor, Personal-Social, Performance, and Practical Reasoning. Children in the Portuguese sample were tested in each of the above mentioned subscales individually.

- Box of toys

The box of toys had toys and games that, as stated by ICCP (International Council for Children's Play), influence children's motor, social and cognitive skills (Michelet, 1998). The assortment of toys was selected in order to

match the same criteria in both samples. The toys included balloons, a magnetic dart board, a bowling set, a yo-yo, a jump-rope, a toy top, an elastic jump-rope, pick-up sticks, puzzles, building blocks, a memory game and a mathematics learning toy. In the Portuguese context an identical set of toys was assembled. Allowing to include cultural and social favorites, in particular in the category of the learning toys a Rubik's cube, a Ludo board and UNO were part of the set.

Procedures

Procedures were similar in Brazil and Portugal. Children were first tested to assess their performance in motor, social, and cognitive skills. According to the randomized distribution, children were included into the control group and the experimental group. Children in the experimental group were introduced to the free play sessions in a room with the box of toys. In this place there was the presence of one adult adopting a neutral vigilant attitude and two research assistants who video recorded the sessions. Each session of free play lasted approximately 30 minutes, twice a week, during three months. The Brazilian sample participated in 20 sessions of free play and the Portuguese sample participated in 18 sessions. The number of sessions in each country depended of the time that each school provided for the research.

While the experimental group was playing, the control group continued the academic activities as usual under the teacher's monitoring. Children were again tested after the three month experiment. Data collected prior and after the experiment was compared to verify whether there were statistically significant changes between pre and post-test in the two groups in both countries.

Data analysis

In order to analyze the data, the statistical software SPSS (Statistical Package for the Social Sciences) version 15 was used. After verifying the data normality and homoscedasticity, it was found that these met the criteria for applying parametric tests. Hence, it was applied to the Student's t-test for independent samples with the goal of comparing the performance of children in the experimental and control groups. In contrast, in order to compare children's behavior in the beginning and the end of the study in each group the Student's t-test for paired samples was used.

RESULTS

Results are presented into two separate blocks. The first block shows the results for the Brazilian sample, while the second block shows the results for the Portuguese sample. The study represents a quasi-experimental design, meaning that not all variables were controlled. Therefore, it was expected that the two groups in both samples, experimental and control groups, show different averages before and after the experimental intervention. The goal in this procedure was precisely to examine whether children from the experimental group had better performance when compared to those in the control group.

Brazil

In Brazil, the children's average age, at the beginning of the experiment, was 7.6 years old, with standard deviation of 0.4 years. Tables 1 and 2 show the distribution of mean and standard deviation for children's scores in each scale. They also show the level of significance for the student t-test (p -values) on pre and post test for the experimental group (Eg) and control group (Cg).

As shown in Tables 1 and 2, the mean differences between experimental and control groups were not significant. Levene's test was used to verify the equality of variances in the samples. The psychological scales did not show significant differences between the two groups, experimental and control, which is a positive result, since groups need to be homogeneous before the experiment.

The scale that assesses children's motor development (EDM) showed in the post-test significant differences for Gross Motor Development [$t(21)=2.13$; $p \leq 0.05$]. This difference is, by mean and standard deviation values, effective for experimental group, see Table 1. Cognitive development, measured by DFHIII, and social development, assessed by IMHSC, did not show significant statistical differences between the experimental and control Groups in the post test, see Table 2.

Each group's results in the pre and post-test were also compared, using the Student's t-test to paired samples. These comparisons aimed to find significant differences in the results of data from psychological scales before and after the experimental intervention within each group. Tables 1 and 2 show that children in the control group displayed some significant changes between pre and post tests. For Motor Performance children showed

Table 1: Distribution of scores in EDM scales on pre and post test for the Brazilian sample.

Psychological scales	Experimental Group	Control Group	Comparison (<i>p-values</i>)			
			Between-groups Paired Two-samples t-test		Within-group Independent One-sample t-test	
	M±SD	M±SD	Pre-test (Eg-Cg)	Post-test (Eg-Cg)	Eg (pre-post)	Cg (pre-post)
EDM						
GMC			0.93	0.07	0.00**	0.00**
Pre-test	85.78±7.20	86.10±10.20				
Post-test	100.67±11.77	92.31±9.48				
Fine motor			0.69	0.46	0.00**	0.06
Pre-test	76.44±9.53	78.69±16.64				
Post-test	90.66±18.47	85.43±15.06				
Gross motor			0.39	0.04*	0.00**	0.14
Pre-test	103.37±16.62	96.47±21.02				
Post-test	118.26±16.75	102.5±18.56				
Equilibrium			0.40	0.08	0.01**	0.20
Pre-test	82.31±14.30	77.75±11.40				
Post-test	100.68±26.96	83.46±18.07				
Physical scheme			0.37	0.31	0.00**	0.00**
Pre-test	86.40±8.32	81.40±16.97				
Post-test	104.61±18.31	96.96±17.46				
Space org.			0.21	0.98	0.05*	0.79
Pre-test	84.11±25.62	96.35±20.14				
Post-test	97.94±20.29	97.72±27.26				
Temporal org.			0.82	0.40	0.09	0.20
Pre-test	86.38±11.32	85.28±11.78				
Post-test	91.84±12.18	87.76±10.41				

Note. * Significant difference $p \leq 0.05$; ** Significant difference $p \leq 0.01$

Table 2: Distribution of scores in DFHIII and IMHSC scales on pre and post test for the Brazilian sample.

Psychological scales	Experimental Group	Control Group	Comparison (<i>p-values</i>)			
			Between-groups Paired Two-samples t-test		Within-group Independent One-sample t-test	
	M±SD	M±SD	Pre-test (Eg-Cg)	Post-test (Eg-Cg)	Eg (pre-post)	Cg (pre-post)
DFHIII						
Percentile			0.24	0.07	0.03*	0.55
Pre-test	70.90 ± 23.47	59.50 ± 22.11				
Post-test	81.09±19.03	62.00±29.47				
IMHSC						
Social skill			0.58	0.90	0.66	0.34
Pre-test	0.69 ± 0.20	0.63 ± 0.31				
Post-test	0.72±0.21	0.70±0.26				
Passive			0.33	0.94	0.41	0.33
Pre-test	0.22±0.15	0.16±0.13				
Post-test	0.19±0.14	0.19±0.15				
Active			0.17	0.89	0.86	0.23
Pre-test	0.08±0.11	0.20±0.27				
Post-test	0.08±0.12	0.09±0.17				

Note. * Significant difference $p \leq 0.05$; ** Significant difference $p \leq 0.01$

Table 3: Distribution of scores in scales on pre and post test for the Portuguese sample

Griffiths subscales	Experimental Group	Control Group	Comparison (<i>p-values</i>)			
	M±SD	M±SD	Between-groups Paired Two-sample t-test		Within-group Independent One-sample t-test	
			Pre-test (Eg-Cg)	Post test (Eg-Cg)	Eg (pre-post)	Cg (pre-post)
Locomotor			0.52	0.10	0.02*	0.61
Pre-test	101.23±5.62	98.80±10.32				
Post-test	104.45±6.67	98.35±9.67				
Personal-Social			0.79	0.01*	0.00**	0.42
Pre-test	86.58±10.21	85.45±9.82				
Post-test	98.18±12.09	86.40±8.52				
Performance			0.74	0.21	0.01**	0.96
Pre-test	99.24±12.69	97.15±15.57				
Post-test	104.49±11.93	97.11±14.33				
Practical Reasoning			0.30	0.11	0.00**	0.03*
Pre-test	96.20±9.51	92.00±8.81				
Post-test	100.59±8.09	95.40±6.24				

Note. * Significant difference $p \leq 0.05$; ** Significant difference $p \leq 0.01$

highly significant differences in the general motor quotient [$t(11)=3.88$; $p \leq 0.01$] and in the physical scheme [$t(11)=3.84$; $p \leq 0.01$]. In cognitive and social assessments, however, no significant differences were found in the control group.

In the distribution of means among the dimensions of Motor Scale (EDM), Table 1 shows that the experimental group showed highly significant differences in the general motor quotient [$t(10)=7.76$; $p \leq 0.01$] and in levels of Fine Motor [$t(10)=3.33$; $p \leq 0.01$], Gross Motor [$t(10)=3.31$; $p \leq 0.01$], Equilibrium [$t(10)=3.18$; $p \leq 0.01$], and Physical Scheme [$t(10)=3.83$; $p \leq 0.01$]. Children in this group also showed significant differences in the space organization level [$t(10)=2.21$; $p \leq 0.05$], but did not show significant differences between pre and post-tests in the temporal organization level. While the experimental group showed statistically significant differences in almost all motor dimensions, the control group showed differences in only two levels: General Motor Quotient and Physical Scheme. These results prove that the intervention produced positive effects in the experimental group.

Within-group analysis of the cognitive performance scale (DFHIII), in Table 2, reported a significant difference between pre and post-tests only for the experimental group [$t(10)=2.52$; $p \leq 0.05$]. Control group did not show significant differences in the assessment of the cognitive performance scale. In regards to social performance, data in Table 2 indicates that there were no significant differences between the experimental and control Groups in the IMHSC - Del Prette scale dimensions.

Portugal

Griffiths Mental Development subscales for Locomotor, Personal-Social Performance and Practical Reasoning were used individually for Portuguese children. The average age of these children was 7.5 years-old, with standard deviation of 0.45 years in both the experimental and control groups. Table 3 shows the results with mean and standard deviation in pre and post tests for both groups, as well as the significance level for the student t-test (*p-values*) to paired and independent samples.

As seen in Table 3, data in the pre test shows no significant differences between experimental and control Group. Thus, there was equivalence between the two groups before beginning the experiment in all subscales. Post-test data demonstrates that the experimental Group had improved more than control Group in all subscales. However, these differences are significant [$t(19)=2.55$; $p \leq 0.01$] only in the Personal-Social subscale.

On the other hand, in relation to pre and post test assessment changes were found in the children's behavior in both groups. In order to perform these analyses, an Independent one-sample t-test was performed. Results indicate that the experimental group benefited from engaging in play activities, since post test results showed to be significantly higher than pre test results for the four subscales: Locomotor [$t(10)=2.71$; $p \leq 0.05$], Personal-Social [$t(10)=4.29$; $p \leq 0.01$], Performance [$t(10)=2.85$; $p \leq 0.01$] and Practical Reasoning [$t(10)=3.29$; $p \leq 0.01$].

The same statistical analysis was performed for the

control group, but the results show significant differences between pre and post test only for Practical Reasoning [$t(9)=2.46$; $p \leq 0.05$]. However, doing a comparative analysis for the results in Practical Reasoning Subscale in both groups, we can see that the highest differences are found in the experimental group ($p \leq 0.01$).

DISCUSSION

The intervention conducted in Brazil and Portugal had similar results. Groups started the experiment displaying homogeneous data in the dimensions measured by the developmental scales. Both in Brazil and Portugal the introduction of free play time in the school context showed to be a positive factor of changes in the experimental groups. In Brazil, these differences were found in locomotor and cognitive scales. In Portugal the differences were found in all scales used: locomotor, personal-social, performance, and practical reasoning. Data confirmed the influence of play in children's development. The function of toys is to provide support and to stimulate children to play which, in turn, will directly operate as an activating mechanism for various developmental aspects during childhood (Pellegrini, 2009; Pellegrini et al., 2007; Pellegrini and Smith, 1998). Finally, the school role is to provide children with the necessary education for fully developing their skills and competences (Brasil, 1997; Teodoro, 2001). Therefore, schools could use toys as tools and practical resources to stimulate development and to provide learning of academic contents. However, not always is there an effective integration between play and literacy in teaching practices, particularly in the transition from preschool to elementary school (Neves et al., 2011). The present study allows to dismiss these beliefs showing the positive effects of short but regular free play sessions on locomotor, social and cognitive performances of school-aged children.

Locomotor performance

By the results obtained in the experiment, both in Brazil and Portugal, children showed significant differences in the dimensions that assessed their locomotor performance. These results provide strong evidence that toys and games used by children contributed to these differences.

Children who have well-developed motor skill dimensions can have success in academic productions, such as writing, for instance (Rosa Neto, 2002). Skills that require locomotion, equilibrium, physical schema, space and temporal organization, and when well-

developed can provide children with better performance and self-regulating behaviors (Rosa, 2002).

The experiment conducted showed to be effective in promoting the development of motor skills in children because it had stimulated the use of intense physical activity. Toys like jump-ropes, yo-yos, bowling, magnetic dart boards and elastic jump-ropes promote playing with intense physical activity. Data from this study is in accordance to Negrine's studies (1994). When this author was conducting observations of child play in Barcelona (Spain), Negrine found that children in this situation are not only playing, but also exercising. This same author also states that both plays and physical exercises are essential for the processes of children's learning and development. Furthermore, play that involves physical activities also promotes and stimulates social interactions, because most of the time it requires the forming of groups (Brougère and Wajskop, 1997). In sum, physical activity play can have immediate beneficial and deferred consequences in distinct domains of development, such as physical, cognitive, and social (Pellegrini and Smith, 1998).

Social performance

Social performance data from Brazilian children did not show significant differences between the two groups, experimental and control. Differences between pre and post-test were not found either. However, the researchers had some difficulties in using the IMHSC scale, which could have affected results and introduced some bias. The first application of this scale was done with electronic means, with the use of audio-visual devices that simulated children's answers. In the second application, after the experiment, researchers had technical problems that made it impossible to use the audio-visual devices. Hence, the scale was administered orally; the researchers asked children which items they should answer. We believe that children may have been confused and uncertain when answering the scale items in the second application.

In Portugal, there were no problems in using the Griffiths scales. Children in the experimental group showed highly significant differences when compared to those in the control group, both before and after tests. The Personal-Social dimension in the Griffiths scale was the one that showed the greatest difference within the control group and greater average increase within the experimental group. These results reveal that the intervention had greater success in the social dimension when compared to the other dimensions.

When provided with free play time children had more opportunities to experience situations that require the

training of negotiating skills, conflict resolution and testing of various social roles involved in make-believe play. These skills exercised during play contribute to more elaborate future social interactions (Del Prette and Del Prette, 2002). Silva et al. (2006) investigated children's street play and found out that play groups are ideal spaces for sharing experiences, for mediation in the construction and abstraction of rules, values and behavior patterns. Drawing a parallel between the findings in Silva et al. (2006) and free play at school we can reach the same conclusions regarding the features of play groups.

The inclusion of free play times in the school schedule favors the increase of children's social interactions as well. In addition and as stated by Del Prette and Del Prette (2005) and Blatchford (1998), a child who shows to be skillful in social interactions can be successful in other dimensions as well, such as learning and other school activities. As claimed by Vygotsky (1998), the individual's social history significantly influences his/her development, including cognitive development. During play children create and strengthen their friendship circles. Friendships, as claimed by Blatchford (1998), can be used within the classrooms as a support for school adjustment. Another benefit of friendship gained through play is its significant support in learning, once playing allows for the emergence of mediation among children (Vygotsky, 1998).

Cognitive performance

Cognition, considered processing and organizing information for future use, is essential to the success of a school-aged child. Data from cognitive scale (DFHIII) for Brazilian children and Griffith's dimensions, which had evaluated Performance and Practical Reasoning in Portuguese children, indicated that the experimental group had better results in cognitive assessments than the control group.

According to ethical and social reasons, the two groups did not differ in any other circumstances and participated as usual in their school routines and benefited from the presence of relatives, neighbors and friends. However, it was observed that the experimental group had significantly higher rates in cognitive performance when compared to the control group, both in Portugal and Brazil.

Free play times during school schedule, offered to the experimental group, resulted in an opportunity for children to spend time with other children, and although in the presence of adult figures, these did not enact any form of adult control. During play time, in order to socially play, children need to exercise the use of certain skills,

such as exploring objects and the environment, establishing strategies to win a game, and memorizing language training (Queiroz et al., 2006). These skills are structures that help in cognitive development and contribute to changes in the levels of children's development (Bomtempo, 1997; Papalia et al., 2006; Queiroz et al., 2006; Vygotsky, 1998).

CONCLUSION

From the data collected in this study we conclude that the inclusion of free play time at school can help children's development. Offering time for free play means providing resources for children to test skills, exercise, expand their domains, and acquire different types of knowledge. For many children, the school environment is the only place they can interact with a large group of children with similar characteristics. However, because of social demands and school requirements children often have few opportunities for free interaction without the direct supervision of adults. Queiroz et al (2006) discusses the need for education professionals to foster environments that encourage play, because play has a positive influence in children's development and helps them to share cultural and social meanings. When professionals who work with children provide them with free play time, it means that they recognize the value of playing and use this as a resource to achieve their goals for the children.

Free play is a child activity that deserves more attention from the school curriculum. Play activates teaching-learning processes in schools, which improves the results of educational activities. From the results in this study, educators can see the benefits of organizing play time in the school curriculum. Contrary to traditional statements, play is a serious matter to children.

Some issues require further investigation such as the development of cross-cultural studies regarding the effectiveness of the intervention proposed in this study. We also suggest that researchers engage in studies to investigate the influence of play in children who have learning difficulties and developmental deficits (Case-Smith and Kuhaneck, 2008). In addition, it is relevant to investigate other ways in which professionals can use play as a resource to promote children's developmental and learning (Neves et al., 2011; Pellegrini and Smith, 1998). On the other hand, and according to the international research literature (Cordazzo and Vieira, 2008; Pellegrini and Smith, 2009) the child's sex is an important variable which modulates the play behavior. In this way, future studies can investigate if the effects or influence of the various kinds of play are distinct for boys and girls. Finally, other instruments, such as observations, interviews and different scales must be

used to verify the influence of play in children's development (Cordazzo and Vieira, 2008; Cordazzo et al., 2010; Cordazzo et al., 2011; Santos and Dias, 2010; Wanderlind et al., 2006).

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