

# Caracterização do jogo simbólico em deficientes auditivos: estudo de casos e controles\*\*\*\*\*

## Characterization of symbolic play in deaf children: case and control studies

Taiana d'Ávila Quintas\*

Luana Mota Curti\*\*

Bárbara Niegia Garcia de Goulart\*\*\*

Brasília Maria Chiarj\*\*\*\*

\*Fonoaudióloga. Especialização em Neurolinguística na Universidade de São Paulo (USP). Endereço para correspondência: R. Freire Farto, 341 - São Paulo - SP - CEP 04343-120 (tai\_quintas@yahoo.com.br).

\*\*Fonoaudióloga. Especialização em Voz pelo Centro de Estudos da Voz (CEV).

\*\*\*Fonoaudióloga. Doutora em Ciências da Saúde pela Universidade Federal de São Paulo - Escola Paulista de Medicina (Unifesp - EPM). Professora Adjunta da Universidade Federal do Rio Grande do Sul (UFRGS).

\*\*\*\*Fonoaudióloga. Doutora em Distúrbios da Comunicação Humana pela Unifesp - EPM. Professora Titular do Departamento de Fonoaudiologia da Disciplina de Distúrbios da Comunicação Humana da Unifesp - EPM.

\*\*\*\*\*Trabalho Realizado na Unifesp - EPM.

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### Abstract

Background: children with hearing loss do not acquire language at the same time nor at the same rate of normal hearing children because the learning process of oral language is essentially auditory. Child development consists in gradually acquiring motor and psychocognitive abilities. Entering the symbolic world is decisive for the child to reach higher levels of linguistic complexity. Aim: to correlate symbolic play and aspects of child development in deaf children and in hearing children. Method: participants of this study were 32 children, of both genders, with ages between 2 and 6 years, age matched. All participants were submitted to the Evaluation of Symbolic Maturation and to the Denver Developmental Screening Test II. Sixteen participants presented moderate to profound sensory-neural hearing loss and composed the research group (RG); the remaining 16 children had normal hearing and composed the control group (CG). Results: symbolism was observed in the play of 81.25% of RG and in 87.5% of CG. In the Denver Developmental Screening Test II, 100% of the RG was classified as being at risk. As for the CG, 94% of the children were classified as normal and the remaining 6% as being at risk ( $p < 0.001$ ). Conclusion: a similar performance was observed between the groups for symbolic play. However, in a qualitative analysis, the RG presented less complex symbolic play than the CG. It was observed that the RG presented a performance in the symbolic play compatible to its performance in aspects of personal-social, refined motor and gross motor control in the Denver Developmental Screening Test II.

**Key Words:** Language development; Child development; Deafness; Symbolism.

### Resumo

Tema: crianças deficientes auditivas não adquirem linguagem no mesmo período e velocidade de uma criança normo-ouvinte, pois o aprendizado da linguagem oral é um evento essencialmente auditivo. O desenvolvimento da criança consiste na aquisição progressiva de habilidades motoras e psicocognitivas, e a entrada no mundo simbólico é fator preponderante para que a criança possa atingir os níveis de maior complexidade no domínio da linguagem. Objetivo: relacionar o jogo simbólico e aspectos do desenvolvimento infantil em crianças deficientes auditivas com seus pares ouvintes. Método: 32 crianças, de ambos os sexos, de 2 a 6 anos de idade, pareadas por idade, foram submetidas à Avaliação da Maturidade Simbólica e ao Teste de Triagem do Desenvolvimento de Denver II, sendo 16 deficientes auditivas neurossensorial de grau moderado a profundo (grupo pesquisa - GP) e 16 normo-ouvintes (grupo controle - GC). Resultados: observou-se simbolismo na brincadeira de 81,25% do GP, enquanto que no GC isto ocorreu em 87,5%. No Teste de Denver II 100% do GP foi classificado como risco, e o GC apresentou 94% de crianças normais e 6% de risco ( $p < 0,001$ ). Conclusão: observou-se desempenho semelhante nos dois grupos quanto ao jogo simbólico. Entretanto, numa análise qualitativa, o GP apresentou brincadeiras menos complexas que o GC. Observou-se que o GP apresentou desempenho no jogo simbólico compatível ao seu desempenho nos aspectos pessoal-social, motor fino-adaptativo e motor grosseiro do Teste de Denver II.

**Palavras-Chave:** Desenvolvimento da Linguagem; Desenvolvimento Infantil; Deficiência Auditiva; Simbolismo.

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## Introduction

Children with hearing impairment do not acquire language at the same pace as children with normal hearing, as oral language is essentially an auditory event (1-3). In the language development process, entering the symbolic world is a preponderant factor for children to be able to achieve levels of greater complexity in mastering language (4). Symbolic function is the capacity to represent the world as it is experienced and involves language, symbolic play, deferred imitation and problem solving through a combination of mental actions and images, which constitute a system of meanings with symbolic function that enable diverse forms of representation (5).

Considering the importance of play in language building and the influence of hearing on the organization of experiences with reality, the aim of the present study was to relate symbolic play and aspects of child development in children with hearing impairment.

## Method

This study received approval from the Ethics Committee of the Universidade Federal de São Paulo/Escola Paulista de Medicina, Brazil (process number 1367/07) and received funding from the Fundação de Amparo à Pesquisa do Estado de São Paulo. Parents/guardians of the children that made up the sample read and signed the term of informed consent.

Thirty-two male and female children from two to six years of age participated in the study; 16 children with hearing impairment made up the study group (SG) and 16 children with normal hearing made up the control group (CG). Children with moderate to severe neuro-sensorial pre-language hearing impairment and no evident neurological or cognitive impairment were selected for the SG. Of these children, 10 (62.5%) attended regular school. Children with normal hearing, no speech/hearing problems, no previous speech/hearing therapy and enrolled in regular school were selected for the CG.

Both groups were submitted to Symbolic Maturity Assessment (6). This evaluation is carried out in two situations of interaction with the child: free play and elicited gestures, the latter of which is made up of two different tasks - imitation of simple gestures and imitation of sequential gestures in familiar routines.

The games were classified according to their complexity considering the natural sequence of

child development. Pre-symbolic play (1st level) represents exploratory play, with no symbolic function. Auto-symbolic play (2nd level) regards situations in which the child acts upon himself/herself. Assimilative symbolic play (3rd level) occurs when the child applies actions to another object (person or doll). Imitative symbolic play (4th level) occurs when the child imitates the actions of others and is capable of inverting his/her role. Symbolic play with a substitute object (5th level) occurs when the child substitutes one object with another based on his/her need. Simple combinatorial symbolic play (6th level) occurs when the child applies an action to different receivers. Multiple combinatorial symbolic play (7th level) occurs when the child applies different actions to a single receiver.

In the imitation of simple gestures, a practical test was performed, in which the stuffed toy frog was made to jump and the child was asked to imitate the following demonstrated actions: flying, smelling, hugging, pushing, brushing its teeth, eating, drinking, placing it on one's head and washing its hands. A practical test was also carried out in the imitation of sequential gestures in familiar routines, consisting of pouring juice into a cup and giving it to a baby doll. Three sequences were then performed by the evaluator and imitated one at a time by the child. The first consisted of giving food to the baby doll, for which a toy chair, doll, bib and banana were used. The evaluator performed the actions and narrated them at the same time ("I'm going to put the baby in the chair, put on its bib, give it a banana to eat and wipe its mouth with the bib"). The second sequence consisted of putting the baby doll to sleep, for which a toy crib, blanket and children's book were used and the evaluator narrated the actions ("I'm going to put the baby in the crib, cover it with the blanket, tell it a story and give it a kiss goodnight"). The third sequence consisted of giving the baby doll a bath, for which a toy bathtub, soap and towel were used and the evaluator narrated the actions ("I'm going to take off the baby's clothes, put it in the bathtub, wash it with soap and dry it with the towel"). All tests were filmed using a Palmcorder IQ (Panasonic) and compact cassette tapes (JVC®).

The Denver II Developmental Screening Test was also administered (7). This test is for children up to six years of age and evaluates gross motor, fine motor adaptive, language and personal-social skills through the determination of 125 items. A vertical line is drawn on the number corresponding to the child's age and crosses the behaviors expected for this age in each of the domains that

compose the test. Some items ask the child to perform particular tasks. Others consider parent/guardian reports. The child receives a classification of "normal" when performing the task or exhibiting the expected behavior, "caution", when not exhibiting a behavior that is observed in 75% to 90% of children of the same age; and "delayed", when not exhibiting an behavior expected for his/her age. For the general classification, the sum is determined of the number of times "caution" and "delayed" are marked. The child is classified as normal when no more than one "caution" is marked on all the tasks and receives a general classification of at risk when two "cautions" and/or one "delayed" are marked.

The results of the Symbolic Maturity Assessment and Denver II Developmental Screening Test were submitted to the appropriate statistical analysis. The Mann-Whitney test and Equality of Two Proportions test were used, with p-values  $\geq 0.05$  considered statistically significant.

## Results

The Symbolic Maturity Assessment revealed symbolism in the play of 81.25% of the SG and 87.5% of the CG.

Regarding the complexity of symbolic play, 25% of the children in the SG exhibited multiple combinatory symbolic play; 6.25% exhibited symbolic play with a substitute object; 12.5% exhibited imitative symbolic play; 37.5% exhibited assimilative symbolic play; and 18.75% exhibited pre-symbolic play. In the CG, 31.25% of the children in the SG exhibited multiple combinatory symbolic play; 12.5% exhibited simple combinatory symbolic play; 6.25% exhibited symbolic play with a substitute object; 25% exhibited imitative symbolic play; 6.25% exhibited assimilative symbolic play; 6.25% exhibited auto-symbolic play; and 12.5% exhibited pre-symbolic play. Table 1 displays the results for both groups regarding the complexity of play.

In the imitation of simple gestures, 50% of the children in the SG and 93.75% of the children in the CG correctly imitated all nine items. In the SG, one child was able to imitate all three sequential gestures in familiar routines; two children were able to imitate two sequences; eight children correctly imitated one sequence; and four children did not imitate any of the sequences. In the CG, three children were able to imitate all three sequences; five were able to imitate two sequences; and eight correctly imitated one sequence. Table 2 displays the performance of the groups on the imitation tasks.

The Denver II Developmental Screening Test classified all the children in the SG as at risk. However, since this is a group of children with hearing impairment and therefore sensory impediment to language development, the option was made to analyze the domains separately. In this analysis, there were considerable differences in performance. None of the children in the SG were classified as normal in language development, whereas their performance in the other domains was better. Eighty-seven percent of the SG was classified as normal in the personal-social domain, 69% in the fine motor adaptive domain and 94% in the gross motor domain.

In the analysis of the performance of the CG on the Denver II Test, 94% of the children were classified as normal and 6% were classified as being at risk. Analyzing the domains separately, 100% of the children in this group were classified as normal with regard to the language, personal-social and gross motor domains and 94% were classified as normal regarding the fine motor adaptive domain. Table 3 displays the qualitative variables from the Denver II Test for both groups.

No relation or statistical association was found between the Denver II Test domains and the more complex play in the SG. Moreover, no relation or statistical association was found between pre-symbolic and symbolic play and the performance of the children in the SG regarding each domain of the Denver II test.

TABLE 1. Comparison of Study Group and Control Group performance regarding more complex play

Type of play	Study Group		Control Group		p-value*
	Qtd	%	Qtd	%	
Auto-symbolic	0	0.0%	1	6.3%	0.310
Assimilative	6	37.5%	1	6.3%	0.033**
Multiple combinatorial	4	25.0%	5	31.3%	0.694
Simple combinatorial	0	0.0%	2	12.5%	0.144
Imitative	2	12.5%	4	25.0%	0.365
With substitute object	1	6.3%	1	6.3%	1.000

\* Equality of Two Proportions test; \*\* statistically significant  $p < 0.05$ .

TABLE 2. Comparison of Study Group and Control Group performance regarding imitation of simple and complex tasks

Parameter	Type of task			
	Simple		Complex	
	Study Group (Cases)	Control Group	Study Group (Cases)	Control Group
Mean	6.88	8.94	1.38	1.69
Median	8.50	9.00	2.00	1.50
Standard deviation	3.05	0.25	0.96	0.79
Total number	16	16	16	16
p-value (between SG and CG)	0.005**		0.484	

\* Mann-Whitney test; \*\* statistically significant  $p < 0.05$ .

TABLE 3. Comparison of the distribution of qualitative variables from the Denver II test between groups

Denver II		Study Group (Cases)		Control Group		p-value *
		Qtd	%	Qtd	%	
Personal-Social	Normal	14	87.5%	16	100%	0.144
	Risk	2	12.5%	0	0.0%	
Fine Motor Adaptive	Normal	11	68.8%	15	93.8%	0.070
	Risk	5	31.3%	1	6.3%	
Language	Normal	0	0.0%	16	100%	<0.001**
	Risk	16	100%	0	0.0%	
Gross Motor	Normal	15	93.8%	16	100%	0.310
	Risk	1	6.3%	0	0.0%	
Total	Normal	0	0.0	15	93.8	<0.001**
	Risk	16	100.0	1	6.3	

\* Equality of Two Proportions test; \*\* statistically significant  $p < 0.05$ .

## Discussion

Play activities have been discussed in different fields of science, arts and communication in the last ten years. Play is part of the learning process that begins soon after birth. It is in this setting that children learn to be sociable, experience their environment and perceive others.

For children with a disability, whether physical, mental or sensorial, play activities seem to be altered or even non-existent; not because play cannot exist, but because disabled children are denied this learning environment. It is common for families and society to feel that these children are incapable of any future prospects. This thinking implies difficulty in providing such children with healthy, natural relationships, thereby compromising the setting that a healthy child would normally have: learning through play.(8)

Symbolic play has been used as an indicator of non-verbal cognitive ability in deaf children and Symbolic Maturity Assessment is effective at assessing psycho-cognitive and language development by means of the assessment of play (9).

In the present study, the SG exhibited more episodes of pre-symbolic play and assimilative symbolic play (which are not complex forms of play) than the CG, whereas the CG exhibited more episodes of simple and multiple combinatory symbolic play (which are more complex forms of play) and fewer episodes of pre-symbolic play. Thus, there is a qualitative difference in performance between both groups regarding symbolic play, which suggests that the children in the SG have deficits in the cognitive skills evaluated and demonstrate difficulties in the perception of reality, resulting in greater learning problems. Similar results are reported in a previous study in which 12-month-old children with hearing impairment were unable to achieve the same level of representational play as hearing children (10).

Imitation is another factor that is closely related to cognitive development in children. According to Jean Piaget, preverbal imitation is one of the manifestations of child intelligence. (5)

In the present study, the CG performed better on the imitation tests and achieved a better performance on the simple gesture imitations. In the sequence imitations of familiar routines, which are more complex tasks, the SG and CG had practically the same performance. This suggests

that children with hearing impairment have the same potential to learn and develop cognitive skills as hearing children, depending on external factors, such as stimulation, social conditions and environmental aspects.

The Denver II Screening Test revealed that 100% of the children in the SG were classified as being at risk for delayed development. This occurred because one delay or two cautions marked on any of the domains of the test determines the final classification. While knowing that development occurs in an integrated fashion among the domains that compose this test, it is important to analyze each domain separately from a qualitative-quantitative perspective, valuing each of the areas of global child development. The language domain of the Denver II Test is mainly made up of items that require oral expression skills, which are delayed in individuals with hearing impairment (11-15).

Thus, the performance of the SG in this domain determined the general classification of this group on the test. However, the findings suggest that the children in the SG do not have impairments other than hearing impairment, as the vast majority achieved normal scores on the other Denver II domains.

## Conclusion

The quantitative analysis revealed that the children impaired hearing and those with normal hearing achieved a similar performance on the Symbolic Maturity Assessment. However, the qualitative analysis revealed that the children with hearing impairment performed more poorly than the control group.

The performance of the children with hearing impairment on the Symbolic Maturity Assessment was compatible to their performance on the personal-social, fine motor adaptive and gross motor domains of the Denver II Test.

A statistically significant difference was found in the percentages of normal and risk findings between the children with hearing impairment and the control group for the total Denver II Test and, specifically, the language domain of this test, with the control group achieving a higher percentage of normal findings.

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