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## Social cognitive performance and different communication settings in groups of children with different disorders

### *Desempenho sócio-cognitivo e diferentes situações comunicativas em grupos de crianças com diagnósticos distintos*

#### Keywords

Language  
 Cognition  
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 Hearing loss  
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 Child

#### Descritores

Linguagem  
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#### ABSTRACT

**Purpose:** To investigate the social-cognitive performance of children with diagnostics of autism spectrum disorder (ASD), mental disability (MD) and hearing impairment (HI) in two different communicative situations. **Methods:** Participated in this study 30 children ages between 3 and 12 years starting speech language therapy processes, divided in three groups: Group 1 – ten children with diagnoses included in the Autism Spectrum Disorders (ASD); Group 2: ten children diagnosed with mental disabilities (MD) and Group 3: ten children diagnosed with hearing impairment (HI). The subjects were assessed in two different communicative situations (group and individual therapy situation) for 12 months. **Results:** Data regarding the performance of the three groups in the two situations show that G3 had better absolute performance when compared with other groups, with the variable symbolic play as an important differential criterion for the three groups. **Conclusion:** We conclude that the social-cognitive performance can be used as an auxiliary tool for intervention, helping the identification of variables that could interfere in the communicative performance.

#### RESUMO

**Objetivo:** Verificar o desempenho sócio-cognitivo de crianças com diagnósticos inseridos nos distúrbios do espectro do autismo (DEA), deficiência mental (DM) e deficiência auditiva (DA) em duas diferentes situações comunicativas. **Métodos:** Participaram desta pesquisa 30 crianças, entre 3 e 12 anos de idade, em início de atendimento fonoaudiológico, que foram divididas em três grupos: Grupo 1: dez crianças com diagnóstico inserido nos distúrbios do espectro do autismo (DEA); Grupo 2: dez crianças com diagnóstico de deficiência mental (DM); Grupo 3: dez crianças com diagnóstico dentro do grupo de deficiência auditiva (DA). Os sujeitos foram analisados em duas situações comunicativas distintas (situação em grupo e situação individual de terapia), durante 12 meses. **Resultados:** O grupo composto por crianças e adolescentes com diagnóstico de deficiência auditiva apresentou melhor desempenho absoluto quando comparado com os outros grupos, sendo a variável jogo simbólico um importante critério diferencial nos três grupos. **Conclusão:** O desempenho sócio-cognitivo pode ser utilizado como instrumento auxiliar no planejamento terapêutico, facilitando a identificação de variáveis que possam interferir no desempenho comunicativo.

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## INTRODUCTION

In the process of child development there is a close connection between cognitive, affective, social and communicative areas, which constitute the basis for symbol's emergence. So, delays in language development may be result from deficits in one or more components of these areas<sup>(1,2)</sup>.

The knowledge about variations in the relations between these areas becomes extremely important in the intervention process. It allows the analysis of the delays' peculiarities in language development from different perspectives.

In autism spectrum disorder's (ASD) it is possible to identify a range of variations that show the close relationship between these different areas. The ASD can be characterized by the presence of a significant deficit in socialization, early onset and chronic course, with a differentiated impact in several developmental areas, such as social relationships, language and adaptative abilities<sup>(3)</sup>. Previous studies<sup>(4-6)</sup> report the occurrence of pragmatic disorders in different communicative situations, identifying different behaviors according to the situation in which they occur.

In mental disability (MD) these changes in behavior associated to different communicative situations can also happen, but it is important to mention that in this disorders there is usually a better understanding of the peculiarities of each communicative situation<sup>(7)</sup>. Children with MD are also reported to present social skills impairments that have a strong impact on social inclusion processes<sup>(8)</sup>.

In these cases, the impairments usually involve social skills, self-care abilities and cognitive performance. However, language disorders caused by functional communicative deficits are the limiting factor for social inclusion of these children<sup>(7)</sup>. We can also mention the disorders resulting from other etiologies that may determine the same communication deficits, one of which the hearing impairment (HI).

The children with hearing impairment may express and understand the familiar situations of interaction, using communicative functions similar to normal hearing children, differing only as to the communicative means used, which is the gestural mean as opposed to the verbal mean, mostly used by their peers with normal hearing<sup>(9,10)</sup>.

Based on the issues mentioned above, it is important to mention that the techniques of audiologic evaluation and diagnostic should have as main purpose the differential diagnosis and improvement of the clinical care<sup>(11)</sup>. The determination of evaluation criteria to the standardization of data is of great importance to effective therapeutic techniques<sup>(12)</sup>. Some authors<sup>(12,13)</sup> mention the importance of identifying appropriate stimulation procedures so that the responses can also be improved.

This way, issues related to the social-cognitive performance have been used as an efficient instrument in determining guideline techniques and therapeutic procedures to intervention process consistent with these disorders. Within this perspective, the assessment of the social-cognitive provides an important complement to identify the patients' language profile who are in initial piagetian stages and contributes to multi and interdisciplinary interventions<sup>(14)</sup>.

Considering the above, this study's purpose was to investigate the social-cognitive performance of children with diagnoses of autism spectrum disorders (ASD), mental disability (MD) and hearing impairment (HL) in two different communicative situations.

## METHODS

The data gathering started after the approval of the research by the Research Ethics Committee of the Centro Universitário Jorge Amado (process # 01.05-2009) and the signature of the consent form by the participants' parents or caregivers.

Participated this study 30 children between 3 and 12 years, starting speech-language therapy at the Speech-Language Pathology Outpatient Clinic of the Centro Universitário Jorge Amado.

The inclusion criteria were: no prior speech-language therapy, currently enrolled in weekly specialized speech therapy weekly for a period exceeding six months and under one year; present diagnostics included in each group criteria.

Subjects were divided into three groups according to the medical diagnosis, according to DSM-IV<sup>(15)</sup> or CID-10<sup>(16)</sup>, as described:

- Group 1: ten children diagnosed within the autism spectrum disorders (ASD);
- Group 2: ten children diagnosed with mental disability (MD), with cognitive development relative to the preoperative period. All subjects underwent clinical evaluation and were considered functional, with no dependence and/or limitation. Subjects who presented any other associated pathology were not included in this group.
- Group 3: ten children diagnosed with severe or profound sensorineural hearing impairment (HI) in the better ear. In this group individuals with neurological problems, behavioral disorders craniofacial malformation and acquired hearing impairment after the pre-linguistic language development were not included.

The patients of all groups were beginning Speech-language Therapy at the School-Clinic of Centro Universitário Jorge Amado.

The gender and language development level variables were not considered as exclusion factors. When necessary, the participants underwent audiological examinations at the institution where the research was conducted. For ethical reasons, all participants were followed at regular speech-language therapy.

During a 12-month period three recording sets, with six months intervals between each were performed for each subject. Each recording set was performed in two different situations during 15 minutes each. Scenario 1: individual language therapy and Scenario 2: child in a group with the activity's coordinator. In this situation free play actives were proposed. The coordination was performed by an adult, the language therapist of any of the group's subjects in the group.

The first situation of individual language therapy the sample of all subjects were used as comparative parameter for the data collection, to verify the group's and individual communicative profile improvement<sup>(3,5,17)</sup>.

Each child's interest objects were used to data gathering, such as piece of tissue, bionic hand, dull pencils, sharpener, waste basket, adhesive tape, paper, house's miniature with furniture, car and telephone. The communicative situations and free activities were determined, such as the communicative context, varying according to individual and group activities, proposed by the adult or chosen by the subjects.

To the data analysis the test developed by Molini-Avejonas and Fernandes<sup>(12)</sup> was used, verifying the following aspects: gestural communicative intention, vocal communicative intent, tool-use, gestural imitation, vocal imitation, combinatory play and symbolic play, and the results were registered in a specific protocol.

### Statistical analysis

The Mann-Whitney test was used to check if there was a difference between the ASD, MD and HI groups in the social-cognitive performance considering the individual observation. The Kruskal-Wallis test was used to compare the three groups.

## RESULTS

The results describe the social-cognitive performance of the subjects of the three groups in the two different situations (Table 1).

Regarding the social-cognitive performance, it is possible to identify differences between the ASD group and the other groups (MD and HI). When the comparison is made between the other two groups (MD and HI) the difference is not easily identified. The same pattern is found when analyzing the communicative situations (group or individual). When the situations are closer to reality, i.e., the group situations, ASD subjects perform better, as compared to the individual situation. Significant difference between the two situations was found in the variable GCI (Gestural Communicative Intent) (Table 2).

Considering data about the three groups' performance in individual situation, it is possible to notice that the hearing impaired had better performance when compared with the other groups (ASD and MD). The same profile can be observed in the situation group.

We emphasize that, globally, when comparing the overall

**Table 1.** Comparison between groups regarding social-cognitive aspects in individual situation of language therapy

Variables	Groups			p-value
	ASD Mean (SD)	MD Mean (SD)	HI Mean (SD)	
<b>1<sup>st</sup> recording</b>				
Gestural communicative intention	3.50 (0.53)	3.00 (0.00)	6.00 (0.00)	---
Vocal communicative intention	2.90 (0.32)	2.00 (0.00)	4.00 (0.00)	---
Tool use	0.40 (0.52)	0.00 (0.00)	1.00 (1.05)	0.2083
Gestural imitation	0.50 (0.53)	1.00 (0.00)	4.00 (0.00)	---
Vocal imitation	2.00 (0.00)	0.90 (0.32)	2.00 (2.11)	0.8393
Combinatory play	2.60 (1.35)	1.00 (0.15)	6.00 (0.00)	0.0030*
Symbolic play	2.00 (0.00)	2.10 (0.66)	5.50 (0.53)	0.0001*
<b>2<sup>nd</sup> recording</b>				
Gestural communicative intention	4.00 (0.00)	4.00 (0.00)	6.00 (0.00)	---
Vocal communicative intention	4.00 (0.00)	3.50 (0.53)	4.00 (0.00)	---
Tool use	1.00 (0.00)	2.50 (0.53)	1.70 (0.48)	0.0050*
Gestural imitation	1.00 (0.00)	1.50 (0.53)	4.00 (0.00)	---
Vocal imitation	3.00 (0.00)	1.00 (0.00)	3.10 (0.99)	---
Combinatory play	3.00 (0.00)	2.00 (1.05)	6.00 (0.00)	---
Symbolic play	3.00 (0.00)	2.50 (0.53)	5.50 (0.53)	<0.0001*
<b>3<sup>rd</sup> recording</b>				
Gestural communicative intention	5.00 (0.00)	5.50 (0.53)	6.00 (0.00)	---
Vocal communicative intention	5.00 (0.00)	4.00 (0.00)	4.00 (0.00)	---
Tool use	4.00 (0.00)	3.50 (0.53)	2.70 (0.82)	0.0267*
Gestural imitation	3.00 (0.00)	2.50 (0.53)	4.00 (0.00)	---
Vocal imitation	4.00 (0.00)	2.50 (0.53)	4.50 (0.71)	0.0002*
Combinatory play	3.00 (0.00)	2.50 (0.53)	6.00 (0.00)	---
Symbolic play	3.00 (0.00)	3.50 (0.53)	5.50 (0.53)	<0.0001*

\*Significant values ( $p \leq 0.05$ ) – Mann-Whitney test

**Note:** SD = standard deviation; ASD = autism spectrum disorder; MD = mental disability; HI = hearing impairment

**Tabela 2.** Within groups comparison regarding social-cognitive aspects in individual situation of language therapy

Variables	Groups			p-value
	ASD Mean (SD)	MD Mean (SD)	HI Mean (SD)	
<b>1<sup>a</sup> recording</b>				
Gestural communicative intention	1.50 (1.58)	2.90 (1.66)	1.50 (0.53)	0.0990
Vocal communicative intention	3.90 (1.29)	2.00 (0.00)	2.00 (0.00)	---
Tool use	0.00 (0.00)	0.00 (0.00)	1.00 (1.05)	---
Gestural imitation	0.00 (0.00)	1.00 (0.00)	0.50 (0.53)	---
Vocal imitation	2.00 (0.00)	0.00 (0.00)	1.00 (0.00)	---
Combinatory play	1.50 (1.58)	2.00 (0.00)	2.00 (0.00)	---
Symbolic play	2.00 (0.00)	2.60 (1.26)	3.00 (1.05)	0.4273
<b>2<sup>a</sup> recording</b>				
Gestural communicative intention	3.00 (0.00)	4.00 (1.15)	2.80 (0.63)	0.0127*
Vocal communicative intention	3.60 (1.26)	2.30 (1.42)	2.70 (0.67)	0.0757
Tool use	2.00 (0.00)	2.50 (1.08)	2.40 (0.70)	0.8413
Gestural imitation	3.00 (0.00)	1.00 (0.00)	1.10 (1.29)	---
Vocal imitation	2.00 (0.00)	2.40 (1.17)	2.40 (0.70)	1.0000
Combinatory play	4.00 (0.00)	2.70 (1.34)	2.20 (0.63)	0.3266
Symbolic play	2.00 (0.00)	2.30 (1.16)	3.10 (1.20)	0.1593
<b>3<sup>a</sup> recording</b>				
Gestural communicative intention	4.50 (0.53)	5.00 (1.05)	5.50 (0.53)	0.0266*
Vocal communicative intention	3.80 (0.42)	4.50 (0.53)	5.50 (0.53)	<0.0001*
Tool use	3.50 (0.53)	3.60 (0.70)	3.80 (0.42)	0.4048
Gestural imitation	3.00 (0.00)	3.30 (0.67)	3.40 (0.84)	0.6188
Vocal imitation	3.50 (0.53)	3.60 (0.52)	3.50 (0.71)	0.9138
Combinatory play	4.00 (0.00)	4.90 (0.99)	5.50 (0.53)	0.1557
Symbolic play	3.50 (0.53)	5.10 (0.99)	4.50 (0.53)	0.0008*

\*Significant values ( $p \leq 0.05$ ) – Mann-Whitney test

**Note:** SD = standard deviation; ASD = autism spectrum disorder; MD = mental disability; HI = hearing impairment

social-cognitive performance of all groups, it is possible to note that the symbolic play variable was the one with significant variation in all groups and all recordings, during the studied period. Therefore it is possible to realize that all groups have different performances and symbolic play may be an important issue to the intervention processes. This difference in performance is similar to both situations: individual and group.

## DISCUSSION

The obtained data may suggest that the analysis social-cognitive skills allows the identification of communicative variables that may better define the different groups, leading to more efficient therapeutic interventions.

These results are compatible with data reported on the literature since the studied disorders do not show severe cognitive disorders. It is important to mention that in what refer to ASD, the subjects may have disabilities, and in MD there are variable cognitive disorders<sup>(7,8,18)</sup>.

Considering these findings, including the assessment of social-cognitive skills in diagnostic assessment model during

evaluation process, may allow the analysis of all areas that interfere with the process of symbolic development<sup>(19,20)</sup>.

Another factor that deserves to be mentioned is that the identification of differences among groups allows the identification of important details of their performance enabling the planning of actions aimed to specific areas. This consideration is relevant when we think about prevention and health promotion and intervention proposals.

It is also important to note that the variations observed in symbolic play may suggest that it can be evidence of the different social abilities and inabilities of the subjects of different groups. This consideration is important when we think about creative play during the therapeutic process as means to increasing communicative intent, the basic principle for a more effective communication<sup>(21)</sup>.

Another important finding is the irrelevance of the communicative situation to which subjects are exposed. It was possible to observe similar social-cognitive performance in both communicative situations studied. Previous studies have shown that for ASD children changes in the communicative situations can interfere on the functional communicative profile<sup>(4-6)</sup>. However,

more recent studies revealed that in familiar situations it does not occur<sup>(22)</sup>.

To obtain more reliable conclusions about the studied variables it is important that further studies involving different communicative situations are conducted. It is important to emphasize that there are few studies in the area in the literature.

## CONCLUSION

The social-cognitive performance can be used as a helpful instrument in the therapeutic process, facilitating the identification of variables that can affect the communicative performance. The development and use of new techniques and procedures based on the perspective of individual's developmental process can promote their effective (re)insertion on the communication process.

Within this context, studies that aim to identify the association between social-cognitive performance and functional communication profile considering issues regarding differences in the communicative situations, can make a significant difference in the evaluation process and development monitoring of these subjects.

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