Chapter 8

Speech-Language Pathology in the Assessment and Diagnosis within the Autism Spectrum

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Additional information is available at the end of the chapter

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1. Introduction

The main purpose of this chapter is to discuss assessment tools that can be used with children and adolescents of the autism spectrum and verify their effectiveness. It will be based on two studies that present the application and comparison of 4 different diagnostic tools. These four instruments are not language-specific and therefore can be used with different groups of children that speak different languages. Certainly cultural variations must be considered but the possibility of using tools that are internationally recognized may contribute to the efforts in improving the amount of information about diagnosis and treatment as proposed by the World Health Organization (WHO) in the World Report on Disabilities (2012).

The first study associates two different methods for identifying the functional communicative profile of children with autism, specifically regarding the initiative and interactivity of communication of individuals with autism.

The FCP-R is a protocol designed to the individual communication assessment developed by Kleiman (1994). It provides a simple and organized evaluation procedure based on age and acquired and/or developmental deficits. It can be used in four different ways: based on an interview with the therapists or the parents; direct assessment of the child/adolescent of observation of filmed samples.

This tool assesses the individual communication abilities in the following areas: Sensory/Motor; Attentiveness; Behavior; Receptive Language; Expressive Language; Pragmatic/Social;

Speech; Voice; Oral; Fluency and Non-Oral Communication. To this study the areas of Behavior; Attentiveness; Receptive Language; Expressive Language and Pragmatic/Social were selected.

The analysis of the functional communicative profile (FCP) adopts the criteria proposed by Fernandes (2004). It uses 15-minute filmed samples of patient-therapist interaction. In these situations the dyads play with toys regularly used in language-therapy sessions and that usually produced good communicative situations. Data are recorded, transcribed and analyzed with a specific protocol.

The analysis of the FCP uses the Pragmatic Recording Protocol [8]. This study used the data about the communicative functions. After the record of the data in the specific protocols the incidence of each communicative function expressed by the participant is determined as well as the proportion of the communicative space occupied, the number of communicative acts expressed per minute and the proportion of more interactive communicative acts expressed.

The occupation of the communicative space is determined by the ratio of communicative acts produced by the participant and by the therapist in each sample. The number of communicative acts expressed per minute was obtained by the ratio of communicative acts expressed and the size of the sample (in minutes). The proportion of interactive communicative acts is defined by the ratio of all communicative acts expressed by the participant and those that expressed one of the more interactive communicative functions.

2. Methods

This chapter will describe two different studies and discuss their results.

2.1. Study 1. Comparison of the *Functional Communicative Profile and the Functional Communicative Profile-Revised* of children and adolescents with autism spectrum disorders

2.1.1. Methods

Participants were 50 children and adolescents with ages between 3 years 9 months and 14 years 8 months (average 7 years 11 months) of both genders with Autism Spectrum Disorders (ASD) attending a specialized Speech-Language Pathology (SLP) service for periods of six months to two years.

All participants were assessed according to the criteria of the *Functional Communicative Profile* (FCP) and of the *Functional Communication Profile – Revised* (FCP-R). The results were recorded, scored and classified.

Since the FCP-R is a tool with technical data, extensive and detailed; therefore it was applied by means of interviews with the speech-language therapist of each participant. All the SLPs have been assigned to each participant for at least six months prior to the interview. This time was considered enough to the therapists to have all the information demanded by the FCP-R.

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The analysis of the FCP considered the five minutes with more symmetric interaction of each sample.

2.1.2. Data analysis

The data obtained by the FCP-R and FCP assessments were individually analyzed, identifying the global performance based on individual comparison.

This comparison used the following areas of the FCP-R:

- Behavior;
- Atention/Concentration;
- Receptive Language;
- Expressive Language;
- Social/Pragmatic.

Data obtained with the use of both tools were compared by the t-Student test and the adopted significance level was 0.05 (5%).

With the purpose of verifying if there were linear correlations between the analyzed areas of both tools the Correlation test was also used. The correlation test identifies the correlation coefficient, that can be positive or negative. In the first case, the positive correlation, the variables present a similar behavior, i.e., if one of them increases the other increases also, and vice-versa. In the negative correlation the variables present the opposite behavior, i.e., if one of them increases the other decreases, and vice-versa.

Data about communication interactivity, number of communicative acts expressed per minute (CAM) and the proportion of communicative space occupied (CSO) were analyzed by means of their averages.

2.1.3. Results and comments

The comparison between the FCP and the FCP-R used the proportion of communicative interaction (CI), the CAM and the CSO obtained by each participant's FCP. CI was obtained by the ratio of the more interpersonal communicative acts expressed and the total of communicative acts expressed. It is considered a very significant data about the overall interactivity of the communication. CAM and CSO were obtained as described above.

The descriptive statistics is presented in the following tables.

The median of the results regarding CI was determined in order to classify the participants as more interactive or less interactive. The individual results presented large variation and the objective of this classification was to associate theses results with the selected areas of the FCP-R. The areas of *Behavior, Attentiveness, Receptive Language, Expressive Language* and *Social/Pragmatic* of the FCP-R were considered the most relevant to this comparison. The median of CI in the FCP was 53.75. Therefore, individuals with interactivity above this level were

considered the more interactive group and those bellow this level were considered less interactive participants.

The association of values of CI obtained in the area of *Behavior of the FCP-R* is presented in Figure 1.

Average	54.35
Standard error	3.05
Median	53.75
Standard Deviation	21.61
Variance	466

Table 1. Descriptive statistics – Communication Interactivity-FCP

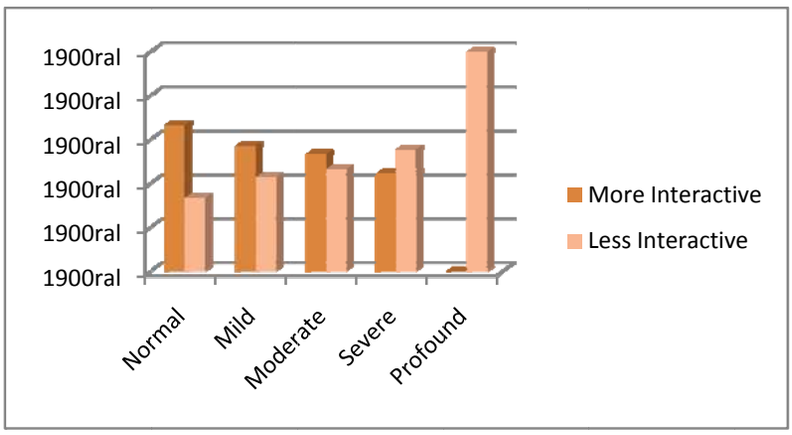

Figure 1. Proportion of communication interactivity de interactivity in the area of *Behavior*

Table 2 shows the comparison of the results in the area of *Behavior in the FCP-R* and its correlation with the proportion of interactivity of communication verified by the FCP.

Severity	**Normal**		**Mild**		**Moderate**		**Severe**		**Profound**	
Behavior(%)	6		14		60		18		2	
Interactivity	More	Less	More	Less	More	Less	More	Less	More	Less
	2	1	4	3	16	14	4	5	0	1
p-value	0.5		0.39		0.16		0.37		0.72	
Correlation coefficient	-0.33445									

Table 2. Association between the area of *Behavior* in the FCP-R and the proportion of communicative interaction in the FCP.

Data suggest that the group defined according to behavioral disorders do not present significant differences regarding the proportion of communication interactivity. However, when the

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linear correlation is considered it can be observed that as the severity increases in this domain the communication interactive proportion decreases. It characterizes a negative correlation, suggesting that participants with more sever behavioral disorders show less interactive communication.

Considering behavioral issues, [21] suggests that intervention focus on communication and interpersonal relationship tends to decrease the behavioral disorders of persons with ASD such as aggression and disruptive behaviors.

The values obtained to communication interaction in the FCP in the area of Attentiveness in the FCP-R are presented in Figure 2.

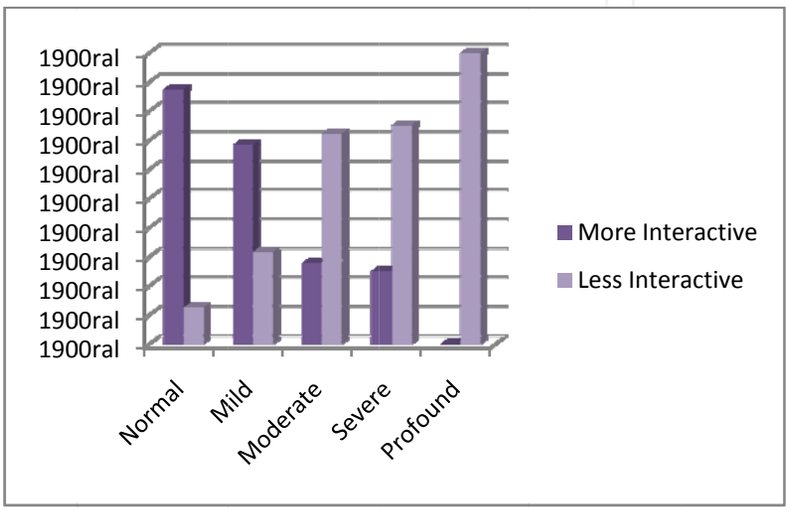

Figure 2. Proportion of communicative interaction in the area of Attentiveness.

Table 3 shows the association of the results in the area of *Attentiveness* of the FCP-R and the proportion of communicative interaction of the FCP.

Severity	Normal		Mild		Moderate		Severe		Profound	
Attention/ Concentration (%)	16		38		36		8		2	
Interactivity	More	Less	More	Less	More	Less	More	Less	More	Less
	7	1	13	6	5	13	1	3	0	1
p-value	0.0009*		0.002*		0.0008*		0.18		0.72	
Correlation coefficient	-0.44623									

*Significant value in the t-Student test at 95%

Table 3. Association of the area *Attentiveness* of the FCP-R and the proportion of communicative interaction of the FCP.

Observing the data we may conclude that the groups defined by deficits in *attention/concentration* present significant differences regarding the proportion of communicative interaction

in the first 3 levels of severity: normal, mild and moderate. In the normal and mild levels the significant results are associated to individuals with high proportions of communicative interaction whereas in the moderate level they are associated with the individuals with low communicative interaction. Analyzing the linear correlation it can be observed that the proportion of communicative interaction decreases as the severity of the *Attentiveness* deficits increases. These data indicate that attentiveness interferes directly in the IC since individuals with better attentiveness results also have higher proportions of IC. In this aspect, [14] have already stated that an attention deficit may be responsible for both the functional language disorders and the social impairment of individuals with ASD.

Figure 3 shows the values regarding the area of *Receptive Language* of the FCP-R and *communicative interaction* according to the FCP.

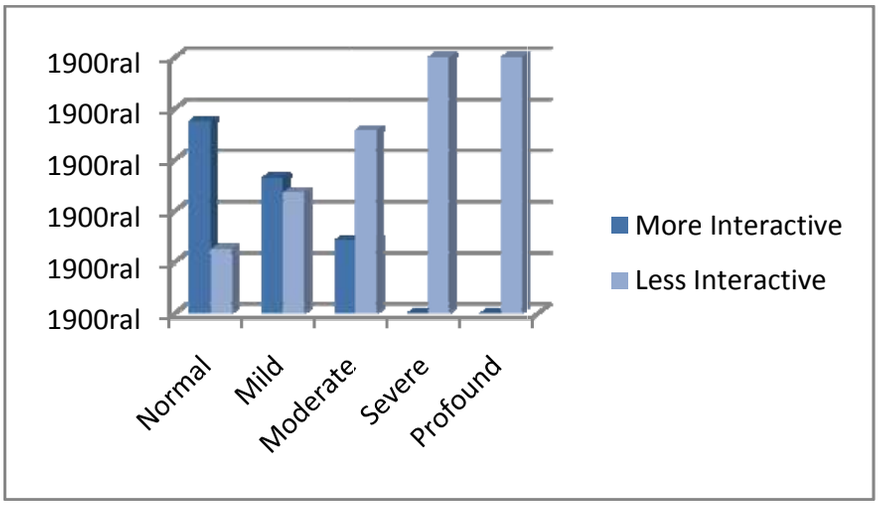

Figure 3. Communicative interaction and Receptive Language.

Table 4 shows the association of the results in FCP-R's area of *Receptive Language* and FCP's communicative interaction.

Severity	Normal		Mild		Moderate		Severe		Profound	
Receptive Language (%)	40		34		14		10		2	
Interactivity	More	Less	More	Less	More	Less	More	Less	More	Less
	15	5	9	8	2	5	0	5	0	1
p-value	<0.001*		0.34		0.07		0.03*		0.72	
correlation coefficient	-0.74981									

*Significant value in the t-Student test at 95%

Table 4. Association of the Receptive language area of the FCP-R and the proportion of communicative interaction of the FCP.

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It is possible to consider that there is a negative correlation between the area of Receptive Language of the FCP-R and the communicative interaction of the FCP. As the severity of receptive language disorders increase, the communicative interaction decreases.

Figure 4 presents the results of the *Expressive Language* area of the FCP-R according to the communication interactivity of the FCP.

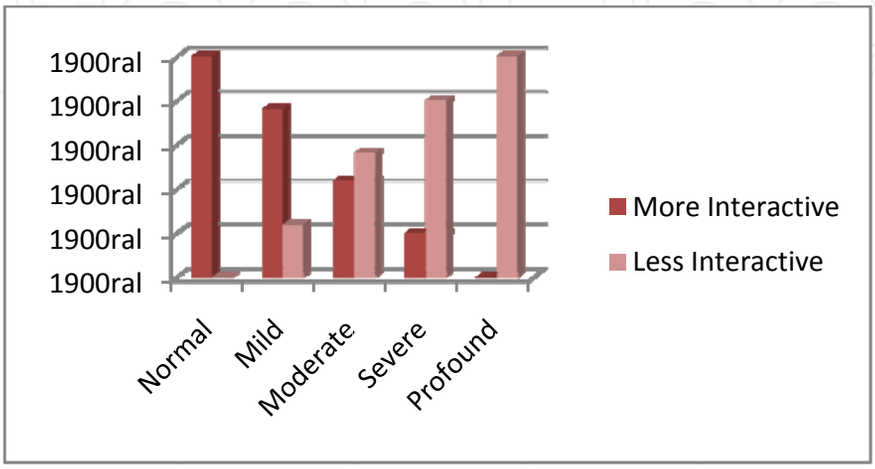

Figure 4. Communicative interaction and Expressive Language

Table 5 presents the association of the results in FCP-R's area of *Expressive Language* and FCP's communicative interaction.

Severity	Normal		Mild		Moderate		Severe		Profound	
Expressive Language (%)	2		42		32		20		4	
Interactivity	More	Less	More	Less	More	Less	More	Less	More	Less
	1	0	16	5	7	9	2	8	0	2
p-value	0.72		<0.001*		0.16		<0.001*		0.46	
Correlation Coefficient	-0.10007									

*Significant value in the t-Student test at 95%

Table 5. Association of the Receptive language area of the FCP-R and the proportion of communicative interaction of the FCP.

These data suggest that there is a negative correlation between the area of Expressive Language of the FCP-R and the communicative interaction of the FCP. As the severity of the expressive language disorders increase, the communicative interaction decreases.

The negative correlations in both receptive and expressive language areas of the FCP-R indicate that IC decreases as the language disorders severity increases. A study conducted by [19], analyzing the functional aspects of the answers of children with severe Specific Language Impairment (SLI) observed that this children are less efficient than their peers of the same age. The authors suggest that this indicates that the formal aspects of language interfere directly in its functional efficiency.

Data about the association between communicative interaction as assessed by the FCP and the area of Social/Pragmatic of the FCP-R are displayed on Figure 5

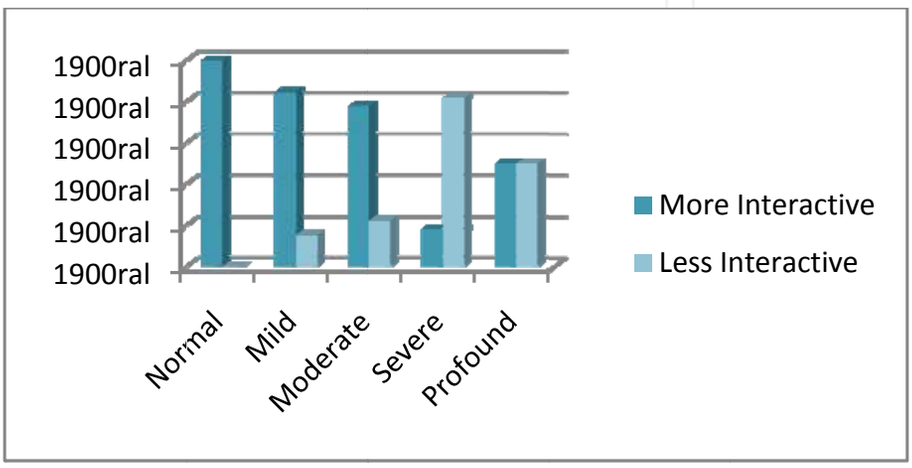

Figure 5. Communicative interaction and Social/Pragmatics

Table 6 presents the association of the results in FCP-R's area of *Social/Pragmatics* and FCP's communicative interaction.

Severity	Normal		Mild		Moderate		Severe		Profound	
Social/ Pragmatic (%)	4		26		18		44		8	
Interactivity	More	Less	More	Less	More	Less	More	Less	More	Less
	2	0	11	2	7	2	4	18	2	2
p-value	0.46		<0.001*		0.008*		<0.001*		1	
Correlation coefficient	0.683702									

*Significant value in the t-Student test at 95%

Table 6. Association of the Social/pragmatics area of the FCP-R and the proportion of communicative interaction of the FCP.

These results suggest that as the disorders in the social/pragmatic area increases, the communicative interaction decreases.However, there is no linear relation between these variables. The

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questions of the FCP-R regarding this area focus on some important social situations and pragmatic abilities but the answer takes into account just the occurrence of the situation, regardless of its frequency or of the consistency with which happens and not considering the focus of the subject's intention.

These findings suggest that objective protocols to the characterization of the pragmatic abilities may not be sufficient to determine the functional communicative profile of a person with ASD. The specific functional assessment of communication seems to be necessary, with the FCP-R providing complementary but not exclusive information. Other studies also suggest the use of complementary assessment tools in order to characterize, identify and assess individuals with ASD due to the variability of the symptoms presented [2, 20].

Still considering the social/pragmatic area of the FCP-R it could be observed that the group with severe disorders has shown significant difference in the IC proportion. This result indicates that both protocols agree that individuals with low social/pragmatic abilities also have less communicative interaction.

These results also agree with several prior studies regarding this issue. [22] observed that children with ASD present less answers to interactive attempts by others and less spontaneous communication. [13] reported that children with ASD have great impairments in the functional use of communication. [1] observed that, even when interacting with a familiar interlocutor, children with ASD have great difficulties with the interactive use of communication. These authors point out that the FCP usually confirm these difficulties.

Data regarding the average of IC and the severity degree in the FCP-R show large deficits in IC as the severity increases. Figure 6 shows the association of the mean proportion of communicative interaction and the areas of the FCP-R that were considered in this study. It indicates that the overall severity of the FP-R is determinant to the proportion of IC.

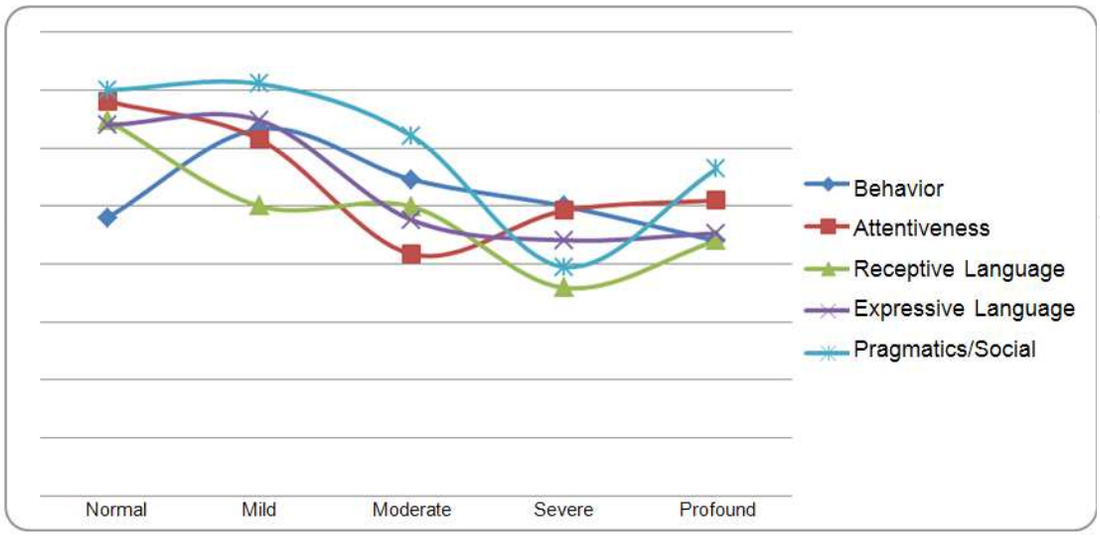

Figure 6. Mean proportion of communicative interaction associated with the FCP-R

The distribution of the average proportion of communicative interaction in this group of participants shows that there is an important decrease in interactivity associated to the increase in severity of the disorders in the areas of the CFP-R that were analyzed.

The following data refer to the association between other aspects of the FCP – communicative acts expressed per minute (CAM) and proportion of the communicatuve space occupied (CSO) and the same areas of the FCP-R.

	Behavior				
	Normal	**Mild**	**Moderate**	**Severe**	**Profound**
CAM	11.3	7.4	7.9	8.1	15.4
CSO(%)	38	42.6	44.1	39.7	39

Table 7. Average of CAM and CSO associated to the *Behavior* area of the FCP-R

The number of communicative acts expressed per minute was similar in the participants with mild to moderate behavior disorders; but it varied in those with *normal* behavior and even more to the ones with profound behavior disorders. However, considering the proportion of the communicative space that was occupied by the participants, all groups had an average bellow 50% (that would indicate an even distribution of CEO among the dyad). It suggests that the large number of communicative acts expressed per minute doesn't leads to communicative efficiency.

The association of behavior disorders identified by the FCP-R and the indicators of communicative intent (CAM and CSO) of the FCP has similar results for the various severity scores. It may suggest that the isolated communicative intent (no adequately addressed) doesn't result in functional efficiency. This brings to attention the issue of the need to take the communicative context into consideration when analyzing pragmatic abilities of individuals with ASD [5, 12].

The averages of CAM and CSO associated to the Attentiveness area of the FCP-R are presented in Table 8.

	Attentiveness				
	Normal	**Mild**	**Moderate**	**Severe**	**Profound**
CAM	8.3	9.1	7.2	9	7
CSO(%)	41.4	45.7	40	39	52

Table 8. Average of CAM and CSO associated to *Attentiveness*

Although the CAM average didn't present a linear distribution, it has a slight decrease between the *severe* and *profound* groups. It suggests that the participants with large attention deficits may even occupy the communicative space symmetrically but their communicative intent is

reduced. Children with severe attention deficits may show more difficulties to start communication when compared to children with mild no none attention deficits.

The averages of CAM and CSO associated to the *Receptive Language* area of the FCP-R are presented in Table 9.

Receptive Language					
	Normal	**Mild**	**Moderate**	**Severe**	**Profound**
CAM	8.5	8.2	8.7	6.2	7.8
CSO(%)	43.7	40.9	45.1	40.4	42

Table 9. Average of CAM and CSO associated to *Receptive Language*

CAM's average shows a decrease tendency as the deficits in receptive language increases, although this is not a linear association. These data seem to suggest that language comprehension is closely associated to the performance regarding the initiative to communicate that is reflected in the number of communicative acts expressed per minute. The association of the severity of the deficits in receptive language and IC has shown that the difficulties in understanding the language expressed may be associated with the few IC. The same occurs with the expressive language: individuals with more impairments tend to show less CAM.

The averages of CAM and CSO associated to the *Expressive Language* area of the FCP-R are presented in Table 10.

Expressive Language					
	Normal	**Mild**	**Moderate**	**Severe**	**Profound**
CAM	13	8.4	8.3	7.8	5.6
CSO(%)	24	43.7	44.6	38.7	44.5

Table 10. Average of CAM and CSO associated to *Expressive Language*

These data point out to the interdependency between the severity of the deficits in *expressive language* and the CAM. There is a clear decrease in the number of communicative acts expressed per minute as the severity of the deficits increases. Therefore, it seems clear that the expressive language abilities are directly associated to the CAM in the FCP.

A longitudinal study of the pragmatic abilities of children with SLI [3] indicated that the CAM is the clearer parameter of disorder for these children.

The association of the social/pragmatic area and CAM and CSO has shown that even small impairments in this area of the FCP-R have are related to proportional deficits in the FCP. These data confirm prior studies [6, 7] that assessed pragmatic therapeutic intervention processes in 6-month to 1-year periods and observed association of results regarding CAM, CSO and IC.

The averages of CAM and CSO associated to the *Social/ Pragmatic* area of the FCP-R are presented in Table 11.

	Social/Pragmatic				
	Normal	**Mild**	**Moderate**	**Severe**	**Profound**
CAM	9.8	8.8	8.8	7.5	8.1
CSO(%)	33.5	45.2	40.1	42.5	44.8

Table 11. Average of CAM and CSO associated to *Social/ Pragmatic*

The CAM average for the *normal* group is higher than all the other groups. It may suggest that any social/pragmatic deficit interferes with the communicative initiative of individuals with ASD.

The analysis of the CAM and CSO averages regarding the selected areas of the FCP-R are presented in figures 7 and 8.

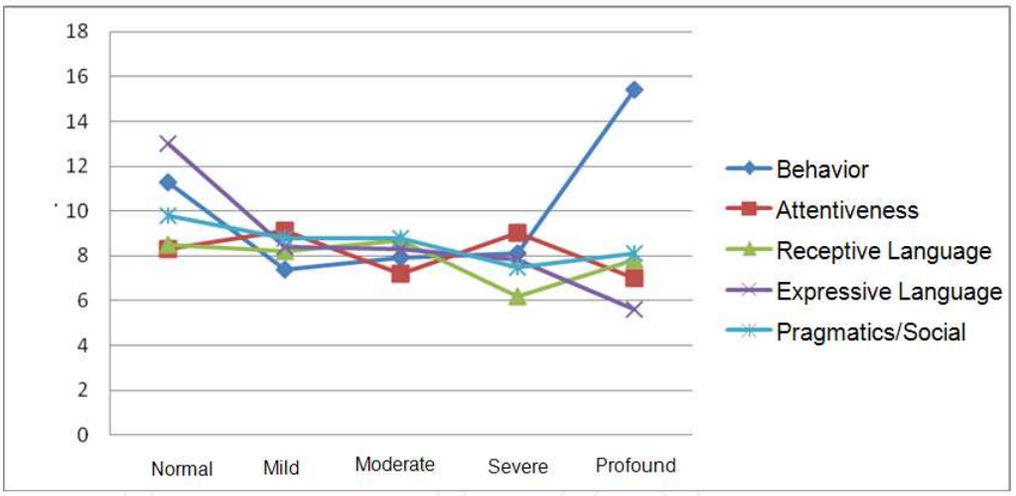

Figure 7. Average of CAM and the selected areas of the FCP-R.

Several studies have been conducted regarding the development, adaptation and validation of diagnostic and severity scales for ASD in Brazil [15], Pereira, Wagner & Riesgo, 2007). There is still no single tool that can provide all the information regarding characterization and severity scores. Therefore the use of complementary protocols seems to be the better alternative for comprehensive and detailed diagnostic and description that will allow efficient planning of intervention procedures. It is true to other countries where other languages are used. Linguistic and cultural adaptations are at least as important as the translation from one language to the other when the use of a foreign assessment toll is proposed.

The second study aimed to identify useful tools to the assessment of the diagnostic hipothesis of ASD and their specific characteristics

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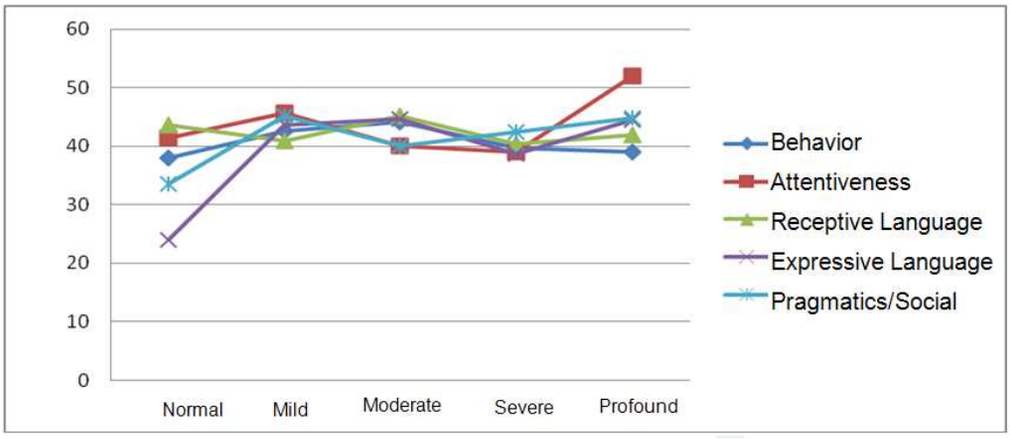

Figure 8. Average of CSO and the selected areas of the FCP-R.

2.2. Study 2. Comparing the results of DAADD and ABC of children included in Autism Spectrum Disorders

2.2.1. Methods

Participants were 45 individuals with ASD and their language therapists. All the individuals were assessed and received language therapy at the Speech-Language Research Laboratory in Autism Spectrum Disorders (LIF-DEA) of the School of Medicine – University of São Paulo (FMUSP), Brazil. They all had been diagnosed with ASD by neurologists and/or psychiatrists according to the DSM-IVtr (2002) or the IDC-10 (2003) criteria.

The *Differential Assessment of Autism and Other Developmental Disorders* (DAADD) [10] was proposed to differentiate, by means of the identification of the child's behavior, specific developmental disorders such as autism, Rett syndrome (RS), Asperger syndrome (AS), pervasive developmental disorders not otherwise specified (PDD-NOS), apraxia, mental deficits (MD) and other syndromes (OS). These three last categories were not focused in this study because they are not included in the ASD according to the DSM-tr or the IDC-10.

According to the DAADD guidelines the participants were divided groups according to their ages (2-to-4years; 4-to-6 years and 6-to-8 years) and age-specific protocols were used to the assessment. Each group comprised 15 participants. Familiar income and school level were not considered inclusion criteria. The DAADD uses technical data, is extensive and demands detailed information; therefore it was applied during an interview with the speech-language therapists of the 45 participants. All the therapists are speech-language pathologists and audiologists (fonoaudiólogas) and were working with the participants for at least 1 year [10].

Figure 9 shows the distribution of the participants according to their ages.

The medical diagnosis of the participants was determined by psychiatrists or neurologists working in public and private services of the state of São Paulo (Brazil). And the distribution of the diagnosis was: 29 children with ASD; seven with PDD; five with PDD-NOS; two with AS; one with High Functioning Autism (HFA) and one with Atypical Autism.

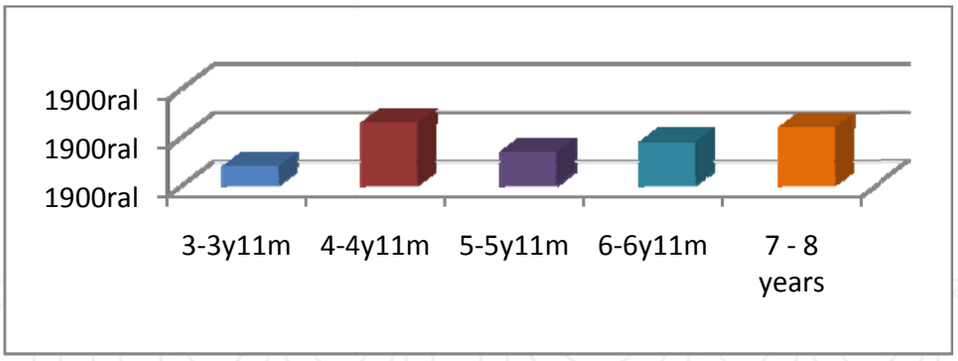

Figure 9. Age of the participants.

Data regarding the Autism Behavior Checklist (ABC) were retrieved from the individuals protocols registered at the LIF-DEA of FMUSP where it is regularly used during the annual assessment process. The ABC (Krug, Arick & Almond, 1993) identifies the non-adaptative behaviors and indicates the probability of the diagnosis of autism. The questionnaire focus on 57 items of atypical behavior within 5 areas: language, sensorial, relational, use of body and object and social abilities. The scores are totaled by area and generate the final general score.

Figure 10 shows the distribution of the participants according to the results of the ABC.

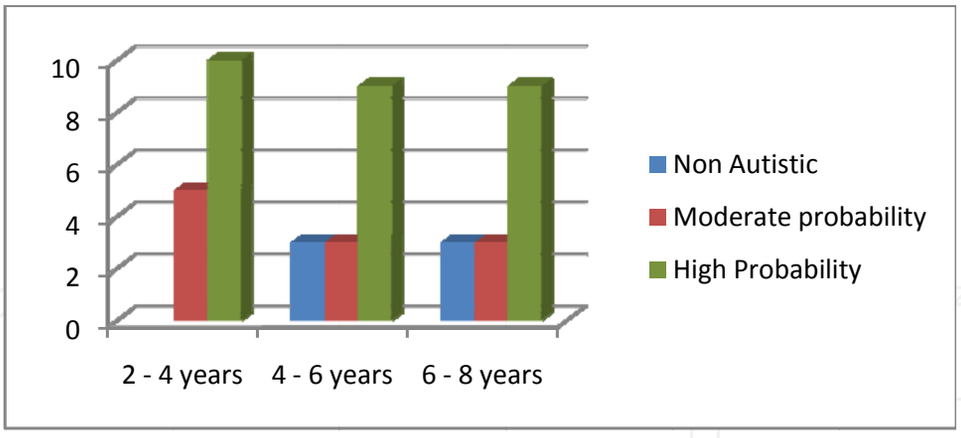

Figure 10. Autism probability according to the *Autism Behavior Checklist*.

2.2.2. Data analysis

Data obtained in the two assessments were analyzed for each subject and the global performance was based on the overall results. Data resulting from the ABC and the DAADD wee associated according to their categories, as shown in Table 12.

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Data of both protocols were compared and the adopted significance level was 0.05 (5%). The significant areas were analyzed by the t-Student test and the Wilcoxon test was used to verify linear correlations between them.

Autism Behavior Checklist (ABC)	Differential Assessment of Autism and Other Developmental Disorders (DAADD)
Language	Language
Relational	Pragmatic
Sensorial	Sensorial
Use of body and object	Motor
Social abilities	Behavior

Table 12. ABC and DAADD areas

2.2.3. Results

It was observed that 20% of the older children were considered "without risk for autism" by the ABC.

Table 13 presents the more frequent answers to the DAADD regarding the developmental disorders considered. It was verified that either in G2 and G3 the most frequent diagnosis was "autism".

Age Groups	Diagnosis	Number of participants
G1	Autism	4
	Rett	9
	Asperger	2
G2	Autism	13
	Rett	2
G3	Autism	10
	Asperger	5

Table 13. Developmental disorders according to the DAADD in all age groups

Comparing the DAADD and the ABC it can be noted that although there is no significant difference, there is a great occurrence of RS according to the DAADD. In G1 these children were rated as with high risk for autism, maybe due to the several motor disorders observed.

With the increasing age these proportion decreases and the high risk for autism is the most frequent score of the ABC in groups G2 and G3. In G3 the DAADD attributes the diagnosis of AS to 75% of the participants of G3.

The Wilcoxon test was applied in the comparison of the ABC and DAADD areas. They were compared within each age group in tables 14, 15 and 16.

The answers to the DAADD and to the ABC are similar in each area. These data indicates that with increasing age the diagnosis identified by the DAADD is closer to the medical diagnosis.

Variables	n	Means (%)	Standart deviation (%)	Minimun (%)	Maximum (%)	Percentile 25 (%)	Percentile 50 (Median) (%)	Percentile 75 (%)	p-value
ABC LG	15	28.39	20.41	6.45	80.65	9.68	25.81	41.94	0.003
DA LGG AUT	15	48.44	13.21	33.33	80.00	40.00	46.67	53.33	
ABC LG	15	28.39	20.41	6.45	80.65	9.68	25.81	41.94	0.003
DA LGG RETT	15	54.44	11.73	41.67	83.33	41.67	50.00	58.33	
ABC LG	15	28.39	20.41	6.45	80.65	9.68	25.81	41.94	0.012
DA LGG DN	15	43.14	12.31	29.41	70.59	3.29	41.18	47.06	
ABC RE	15	48.25	17.37	19.05	78.57	35.71	47.62	61.90	0.001
DA PRAG AUT	15	74.67	11.60	60.00	100.00	66.67	73.33	80.00	
ABC RE	15	48.25	17.37	19.05	78.57	35.71	47.62	61.90	0.001
DA PRAG RETT	15	79.56	11.67	66.67	100.00	66.67	80.00	86.67	
ABC RE	15	48.25	17.37	19.05	78.57	35.71	47.62	61.90	0.002
DA PRAG AS	15	75.83	9.99	62.50	93.75	68.75	75.00	81.25	
ABC RE	15	48.25	17.37	19.05	78.57	35.71	47.62	61.90	0.002
DA PRAG DN	15	75.42	10.15	62.50	93.75	68.75	75.00	81.25	
ABC BO	15	62.67	15.76	36.00	84.00	48.00	68.00	76.00	0.017
DA BEH AS	15	43.33	26.01	8.33	91.67	16.67	50.00	66.67	
ABC BO	15	62.67	15.76	36.00	84.00	48.00	68.00	76.00	0.041
DA BEH DN	15	43.03	29.05	0.00	90.91	18.18	54.55	72.73	

Legend:ABC=Autism Behavior Checklist; LG=language, DA=Differential Assessment of Autism and Other Developmental Disorders, LGG=language, AUT=autism, RETT=Rett Syndrome, DN=pervasive developmental disorder not otherwise specified, RE=relating, PRAG=pragmatics, AS=Asperger Syndrome, BEH=behavior, BO=body-object use.

Table 14. Comparison of the different areas of the DAADD and the ABC to G1

Variables	n	Means (%)	Standart deviation (%)	Minimun (%)	Maximum (%)	Percentile 25 (%)	Percentile 50 (Median) (%)	Percentile 75 (%)	p-value
ABC LG	15	60.00	25.51	22.58	93.55	35.48	61.29	83.87	0.001
DA LGG AS	15	25.56	19.02	8.33	75.00	8.33	25.00	33.33	
ABC LG	15	60.00	25.51	22.58	93.55	35.48	61.29	83.87	0.001
DA LGG DN	15	14.44	15.26	0.00	50.00	0.00	16.67	16.67	
ABC RE	15	61.11	17.33	19.05	95.24	57.14	61.90	69.05	0.018
DA PRAG DN	15	46.67	17.99	20.00	80.00	40.00	40.00	60.00	
ABC SE	15	59.09	19.59	22.73	100.00	45.45	63.64	72.73	0.005
DA SE AUT	15	34.81	20.52	11.11	88.89	22.22	33.33	44.44	
ABC SE	15	59.09	19.59	22.73	100.00	45.45	63.64	72.73	0.005
DA SE RETT	15	34.81	20.52	11.11	88.89	22.22	33.33	44.44	
ABC SE	15	59.09	19.59	22.73	100.00	45.45	63.64	72.73	0.001
DA SE AS	15	23.33	22.54	0.00	83.33	16.67	16.67	33.33	
ABC SE	15	59.09	19.59	22.73	100.00	45.45	63.64	72.73	0.001
DA SE DN	15	24.00	20.28	0.00	80.00	20.00	20.00	40.00	
ABC BEH	15	49.12	23.91	13.16	81.58	26.32	52.63	73.68	0.008
DA MOT AUT	15	28.00	23.66	0.00	70.00	10.00	20.00	50.00	
ABC BEH	15	49.12	23.91	13.16	81.58	26.32	52.63	73.68	0.009
DA MOT RETT	15	26.67	22.91	0.00	72.73	9.09	18.18	45.45	
ABC BEH	15	49.12	23.91	13.16	81.58	26.32	52.63	73.68	0.016
DA MOT AS	15	27.50	25.09	0.00	75.00	12.50	25.00	37.50	
ABC BEH	15	49.12	23.91	13.16	81.58	26.32	52.63	73.68	0.001
DA MOT DN	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ABC BO	15	64.00	17.63	32.00	88.00	52.00	68.00	80.00	0.005
DA BEH AUT	15	30.91	26.35	0.00	90.91	9.09	27.27	36.36	
ABC BO	15	64.00	17.63	32.00	88.00	52.00	68.00	80.00	0.009
DA BEH RETT	15	36.19	27.46	0.00	85.71	14.29	42.86	57.14	
ABC BO	15	64.00	17.63	32.00	88.00	52.00	68.00	80.00	0.003
DA BEH AS	15	30.30	23.47	0.00	81.82	9.09	27.27	36.36	
ABC BO	15	64.00	17.63	32.00	88.00	52.00	68.00	80.00	0.003
DA BEH DN	15	32.12	25.22	0.00	81.82	9.09	27.27	45.45	

Legend:ABC=Autism Behavior Checklist; LG=language, DA=Differential Assessment of Autism and Other Developmental Disorders, LGG=language, AUT=autism, RETT=Rett Syndrome, DN=pervasive developmental disorder not otherwise specified, RE=relating, PRAG=pragmatics, AS=Asperger Syndrome, BEH=behavior, BO=body-object use, SE=sensory, MOT=motor

Table 15. Comparison of the different areas of the DAADD and the ABC to G2.

Variables	n	Means (%)	Standart deviation (%)	Minimun (%)	Maximum (%)	Percentile 25 (%)	Percentile 50 (Median) (%)	Percentile 75 (%)	p-value
ABC SE	15	43.94%	21.37%	0.00%	77.27%	31.82%	45.45%	59.09%	0.030
DA SE AS	15	28.33%	28.14%	0.00%	75.00%	0.00%	25.00%	50.00%	
ABC SE	15	43.94%	21.37%	0.00%	77.27%	31.82%	45.45%	59.09%	0.020
DA SE DN	15	13.33%	35.19%	0.00%	100.00%	0.00%	0.00%	0.00%	
ABC BEH	15	40.00%	24.33%	0.00%	73.68%	13.16%	47.37%	57.89%	0.001
DA MOT DN	15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	

Legend: ABC=Autism Behavior Checklist, DA=Differential Assessment of Autism and Other Developmental Disorders, DN=pervasive developmental disorder not otherwise specified, AS=Asperger Syndrome, BEH=behavior, BO=body-object use, SE=sensory, MOT=motor

Table 16. Comparison of the different areas of the DAADD and the ABC to G3.

3. Discussion

The results of the two protocols tend to be more similar with the increasing age. The DAADD has shown to be more sensible in the different age-groups, while the ABC seems to be more specific only in the older group. It must be noted that the ABC aims just to identify the risk for autism while the DAADD differentiates the children that already have the diagnosis within the autism spectrum.

The need for diagnostic protocols that consider the association of communication and behavior disorders of children with ASD is clear. These protocols must provide means for the careful observation and record of communicative behaviors (Matson, Nebel-Schwalm & Matson, 2006; [18].

The comparison of the different areas of the DAADD and the ABC has shown that the DAADD is more efficient to the identification of language disorders. It must be considered, however, that this is not the purpose of the ABC. The use of both protocols may be complementary, applied as needed along the diagnosis process. In several countries and in different regions of many countries providing services of medical diagnosis for children with ASD takes precious time. The time spent waiting for the conclusion of the diagnostic process would be extremely important to the child's development. The sooner the child receives appropriate therapy and education, the better the prognosis (Volkmar, Chawarska & Klin, 2005) Therefore, the use of screening tools that helps to identify children at risk for ASD or with some probability of receiving this diagnosis may represent the better use of resources that are frequently limited.

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The comparison of different protocols, especially considering the needs of non-English-speaking groups, allow a more comprehensive perspective about tools that can be used in the assessment process of children with developmental disorders.

4. Conclusions

During the last decades important changes have taken place regarding the concept and prevalence of ASD. This resulted in a greater need for screening tools that can be used in public health programs designed to provide services to an increasing number of children as soon as possible in their development.

The diagnosis of ASD often produces, besides the emotional stress in the affected families, large social and emotional impact. It implies in the urgent need for efficient models of screening and diagnosis that can support intervention plans that are individually planned and implemented. Early diagnosis and intervention are essential to the better prognosis; therefore clinicians and researchers have been dedicated to the development of efficient strategies to the identification of disorders and intervening factors.

Several diagnostic and assessment tools have been proposed, aiming the early identification of ASD. However, the efforts to improve the early identification of children with ASD will only be effective if the diagnosed children have access to appropriate intervention services. Considering that the assessment process may be long and expensive and that the diagnosis frequently depends on clinical impressions, the use of specific and sensitive tools is essential.

In this context an important aspect to be considered in the use of specific tools to the assessment and diagnosis of children with ASD is that it should be possible to use them despite the diversity of symptoms that are characteristic of these children. Besides, these tools should also be able to identify the central features of ASD. Cultural aspects and the possibility of use in different contexts should also be considered.

Finally, although there are several tools for the screening, assessment, diagnosis and follow-up of children with ASD, there is not just one protocol that can be universally used. In the clinical practice the assessment, diagnosis and follow-up of intervention processes still depends on the clinician's abilities that chooses specific and complementary tools.

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References

[1] Amato, C.A.H. & Fernandes, F.D.M. 2010. Interactive use of communication by verbal and non-verbal autistic children. Pro Fono Rev Atual Cien, vol. 22, No 7, (December 2010), pp.373-378, ISSN 0104-5687

[2] Barbosa, M.R.P., Pimentel, A.G.L., Amato, C.A.H., Fernandes, F.D.M., Balestro, J.I., Santos, T.H.F. & Valino, V.C. 2011. Pervasive developmental disorders screening test – II: viabilidade de aplicação em indivíduos do espectro autístico. Rev Soc Bras Fonoaudiol, vol 16, supl 2011, pp.668, ISSN 2179-0841

[3] Befi-Lopes, D.M., Puglisi, M.L., Rodrigues, A., Giusti, E., Gândara, J.P. & Araújo, K. 2007. Communicative profile of children with language impairment: longitudinal characterization of pragmatic abilities. Rev Soc

[4] Bras Fonoaudiol, vol. 12, No 4 (October-December 2007), pp. 265-76, ISSN 1982-0232

[5] Bernard-Optiz, V.V.1989. Pragmatic analysis of communicative behavior of autistic child. J Speech Hear Disord. Vol. 47 (February 1982), pp. 107-121. ISSN 1944-7515

[6] Cardoso, C. & Fernandes F.D.M. 2006. Relation between social cognitive aspects and the functional communicative profile in a group of adolescents of the autistic spectrum. Pro Fono Rev Atual Cien, vol. 18, No. 1, (March, 2006), pp.89-98, ISSN 0104-5687

[7] Fernandes F.D.M., Cardoso, C., Sassi, F.C., Amato, C.A.H., Sousa-Morato, P.F. 2008. Language therapy and autism: results of three different models. Pro Fono Rev Atual Cien, vol. 20, No. 4 (December, 2008), pp. 267 – 72, ISSN 0104-5687

[8] Fernandes, F.D.M. 2000. Aspectos funcionais da comunicação de crianças autistas. T Desenvolv, vol. 9, No 51, (April, 2000), pp.25-35, ISSN 0103-7749

[9] Fernandes, F.D.M. Pragmática. In: ABFW: teste de linguagem infantil nas áreas de fonologia, vocabulário, fluência e pragmática, Andrade, C.R.F., Befi-Lopes, D.M., Fernandes, F.D.M. & Wertzner, H.F., 2000, 89-97, Pró Fono, ISBN 8585491.45-0, Barueri, Brazil

[10] Gail, J.R. & Lynn, K.C. 2003. Differential Assessment of Autism and Other Developmental Disorders (DAADD). Linguisystems. ISBN 1-55999-485-1, 2003, Illinois.

[11] Kleiman, L.I. 2003. Functional Communication Profile-Revised. LinguiSystems, ISBN 1-55999-485-1. 2003, Austin, Texas.

[12] Koegel, L.K. 2000. Interventions to facilitate communication in autism. J Autism Dev Disord, Vol. 30, No. 5, (August, 2000), pp. 383-391, ISSN 0162-3257

[13] Laugeson, E.A., Frankel, F., Mogil, C. & Dillon, A.R. 2009. Parent-Assisted Social Skills Training to Improve Friendships in Teens with Autism Spectrum Disorders. J Autism Dev Disord, vol. 39, No. 3 (August, 2009), pp. 596-606, ISSN 0162-3257

[14] Loveland, K. & Landry, S. Joint attention and language in autism and developmental language delay. J Autism Dev Disord. Vol.16, No. 3, pp. 335-349, ISSN 0162-3257

[15] Marteleto, M.R. & Pedromônico, M.R. 2005. Validity of Autism Behavior Checklist (ABC): preliminary study. Rev Bras Psiquiatr. Vol. 27, No. 4, (December, 2008), pp. 295-301, ISSN 1516-4446

[16] Matson, J.L., Nebel-Schwalm, M. & Matson, M.L. 2007. A review of methodological issues in the differential diagnosis of autism spectrum disorders in children. Res Autism Spectr Disord, Vol. 1, (2007), pp. 38-54, ISSN 1750-9467

[17] Pereira, A.M., Wagner, M.B. & Riesgo, R.S. 2008. Autismo Infantil: Tradução e validação da CARS (Childhood Autism Rating Scale) para uso no Brasil. J. Pediatr, Vol. 84, No. 6, pp. 487-494, ISSN 0021-7557

[18] Posserud, M., Lundervold, A.J., Lie, S.A. & Gillberg, C. 2010. The prevalence of autism spectrum disorders: Impact of diagnostic instrument and non-response bias. Soc Psychiatr Epidemiol, Vol. 45, (2010), pp. 319-327 ISSN 0933-7954

[19] Rocha, LC; Befi-Lopes, DM. Analyses of answers presented by children with and without specific language impairment. Pro Fono Rev Atual Cien, Vol. 18, No. 3, pp. 229-238, ISSN 0104-5687

[20] Santos, T.H.F., Barbosa, M.R. P., Pimentel, A.G.L., Lacerda, C.A., Balestro, J.I., Amato, C.A.H. 2012. Comparing the use of the Childhood Autism Rating Scale and the Autism Behavior Checklist protocols to identify and characterize autistic individuals. J Soc Bras Fonoaudiol. Vol. 24, No. 1 (December, 2012), pp. 104-6, ISSN 2179-6491

[21] Springhouse. Enfermagem psiquiátrica – Incrivelmente fácil. 2006. 1ª Ed., Guanabara-Koogan, ISBN 9788527704298, Rio de Janeiro, Brazil.

[22] Watson, L.R., Baranek, G.T., Crais, E.R., Reznik, J.S., Dykstra, J. & Perryman, T. 2007. The First Year Inventory: Retrospective Parent Responses to a Questionnaire Designed to Identify One-Year-Olds at Risk for Autism. J Autism Dev Disord. Vol. 37, No. 1 (January, 2007), pp. 49–61, ISSN 0162-3257

[23] World Health Organization World Report: Disabilities. Geneva (CH): World Health Organization, 2011.

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