Language therapy and autism spectrum: the therapeutic environment interference

Terapia de linguagem no espectro autístico: a interferência do ambiente terapêutico

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ABSTRACT

Purpose: To analyze the functional communicative profile of children and adolescents with autistic spectrum disorders in two different language therapy environments which differ from each other on the physical environment. **Methods:** Participants were ten subjects with autistic spectrum disorders, six male and four female, with ages varying from 4 to 13 years. For data gathering, eight 30-minute individual language therapy sessions were videotaped: four sessions in regular therapy settings (common room) interspersed with four sessions in a specific environment setting (NIC room), for one month. Results were registered on the Pragmatic Protocol, and statistical analysis was carried out. **Results:** No significant differences were found between the pragmatic profile presented by the subjects in the common room and in the NIC room. **Conclusion:** The physical environment studied did not significantly influence the functional communication profile of the autistic subjects, even though there were individual tendencies to present better performance in one room or another.

Keywords: Language; Autistic disorder; Intervention studies; Social communication; Child; Adolescent

INTRODUÇÃO

Literature points out that communication is one of the central features of the Autistic Spectrum Disorders (ASD)[1-3]; specially in what refers to the functional use of language[4-8], that is directly related to the social interaction inabilities[1,4,9] and behavioral disorders[10], therefore being essential to the understanding and intervention in these cases[3-5,11].

In studies about language therapeutic procedures with ASD children and adolescents it is necessary to consider the context and its influence in language use[4,12,13], vocabulary and syntax[13]. Other authors[14] suggested that ASD children's inabilities with complex social situations may be associated to the fact that they frequently are more attentive to specific environment details and fail to understand the general context.

Context is composed by a series of aspects that contribute to the meaning intended by the speaker in a communicative exchange. It is determined by the physical, social and psychological environment[15]. The same authors explain that regarding the psychological aspect the most important contextual features are related to individual motivations and convictions and their roles in the actual interaction.

They[15] divided the physical aspects in: access (ability to reach the physical objects), space (distance between agents and objects of the physical world to which the communicative act refers) and time (chronological succession of events referred by the communicative act). The social aspect refers to the discourse (information conveyed through the discourse before the communicative act is performed), the movement (performed by the interlocutors) and position (between interlocutors)[15].

Considering these elements, several studies[4,12,13,16] reported the importance of the context to the communicative performance of children with ASD. The literature describes that play situations favor communication and are rich in details[13].

It is still pointed out that contexts of joint attention and joint play during language therapy increases the experiences of well succeeded communication[17], while physical contexts restricted to tables and chairs usually allow fewer possibilities of gestural expression than ample spaces that allow the children to play on the floor and participate in ball games[18].

Therefore, any language assessment or therapeutic intervention should take into account the context in which the

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This work is a partial report of research conducted at the doctorate program of the first author in Linguistics and Semiotics at the Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo – USP – São Paulo (SP), Brazil, under supervision of the second author.

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Received: 10/30/2009; **Accepted:** 7/22/2010

communication takes place[4,12,16,19]. The inclusion of ASD children in different communicative contexts of language therapy has produced different functional communicative profiles and social cognitive performances[12] and interpretation of the vocal expression[15].

Studies about contextual variable that intervene in the communicative performance in ASD children are needed to determine more efficient therapeutic contexts and strategies.

The aim of the present study was to analyze the functional communicative profile (FCP) of ASD children and adolescents in two language therapy environments that present different physical characteristics.

METHODS

Subjects

Participants were ten children and adolescents with ASD diagnosis, six males and four females with ages between 4 and 13 years (mean=7.9 years). They were diagnosed by psychiatrists according to the DSM-IV and ICD-10 criteria[20,21] and were included in language therapy twice a week. All participants were attending language therapy for at least one year and for no more than 6 years at the study's onset and issues as age, gender, school adaptation, use of verbal or non-verbal communication and IQ were not considered as exclusion criteria. Data were gathered on the end of the school year and therefore the participants were familiar with the therapists (Chart 1). Due to the heterogeneity of the clinical manifestations of autistic children, each subject was his/her own control.

Chart 1. Sample identification – subjects with Autism Spectrum Disorders

Subjects	Age (years)	Gender	Time in therapy (years)	Psychiatric diagnosis
1	5	M	3	Autism
2	11	M	6	Autism
3	5	M	1	Autism
4	5	F	1	Autism
5	6	M	1	Autism
6	12	M	6	PDD
7	9	F	2	PDD
8	9	F	4	PDD
9	13	F	2	PDD
10	4	M	1	Asperger syndrome

Note: PDD = Pervasive Developmental Disorder; M = male; F = female

Material

Besides the filming equipment to the recording of the language therapy sessions, toys and games were available in the two different therapeutic rooms. In both rooms there were miniatures of household items, transportation means, animals, telephone, fruits, strollers, charts, pressing iron, dolls, doll clothes, balls, hair comb, brush, dryer, mirror, make-up, magazines, paper and pencils.

The FCP protocol was used[22].

Procedures

Data were gathered at the same service in which the children received language therapy twice a week after the consent form was signed by a responsible adult.

Video-taped 30-minute samples of eight therapeutic sessions were filmed with each subject. A common therapeutic room was used in four of them and the other alternated four sessions used a specially planed room (herein called NIC room). All sessions occurred during a 1-month period to ensure the subjects attendance aiming greater data consistency. This short term period guaranteed the presence of all subjects in all scheduled session.

This research didn't aim to assess the therapeutic results obtained in each room, but to observe is the FCP of ASD children and adolescents was influenced by the environmental context.

The theoretical perspective adopted in the therapeutic process was based on the pragmatic theories that emphasize linguistic and non-linguistic communicative elements, communication initiative, context and the participation of different interlocutors[16]. In both rooms the therapists were instructed to promote free play situations allowing interactions based on the subjects' interests.

The main aspects distinguishing the regular and the NIC room refer to their physical aspects what, according to the literature[15], is one of the elements of the interactive context. In the present study the regular room had 9m^2 and included a table, chairs, a mat and a wardrobe with toys that was kept with its door open in the beginning of each session and from where the children could retrieve new toys during the activities.

The NIC room has approximately 30m^2 and had children-adapted furniture and scenarios like kitchen (with sink, stove, microwave oven, refrigerator and table with chairs), living room (with couch and side table) and bedroom (with wardrobe, bed, basinet and dolls) and other toys (Figure 1). All material was exposed according to their functions and was available to the children, as in a house replica.

The FCP[22] verified the number of communicative acts expressed per minute, the communicative functions and the communicative means used by the subjects. The communicative act refers to the communicative initiative and the number of communicative acts initiated by the subjects during the interaction with the adult is noted. The communicative mean may represent the verbal competence; the analysis refers to the proportion of use of verbal, vocal and gestural means in the communicative acts produced by the subjects. The communicative functions reveal the subject's functional competence; the analysis involves the communicative function of each communicative act.

In this study the communicative functions were divided in more interactive and less interactive[23] considering that the more interactive communicative acts are directed to the adult and the less interactive aren't. The more interactive

Figure 1. NIC room

communicative functions are: object request, action request, social routine request, consent request, information request, recognition of other, exhibition, comment, naming, exclamation, narrative, expression of protest, protest and joint play and the less communicative functions are: reactive, performative, non-focused, exploratory and self-regulatory[16].

After the FCP analysis of the footage by the first author, its consistency was tested comparing with the analysis performed by other observers in 20% of the samples and the agreement rate was 98.34%, considered a good consistency result.

The statistical analysis of data used the following tests: t Student[24] to the comparison between the results on FCP on both rooms the Wilcoxon to verify possible differences between the two rooms in different variables[24].

RESULTS

First individual data will be presented, followed by data about number of communicative acts per minute, use of communicative means and communicative functions presented by the 10 ASD subjects in the regular room and in the NIC room.

Table 1 shows the mean numbers of communicative acts per minute expressed by the 10 subjects in both rooms and the t-Student test results.

Most of the subjects presented higher mean number of communicative acts in the NIC room. However, there was no statistical significance in the results regarding the differences between both rooms.

Table 1. Number of communicative acts per minute for each subject in both rooms

Subjects	Regular room	NIC room
1	6.3	5.6
2	4.9	4.6
3	1.5	1.7
4	2.4	2.3
5	2.8	3.2
6	6.3	7.0
7	4.0	4.1
8	5.3	5.7
9	3.2	3.7
10	4.0	4.3
Mean	4.1	4.2
SD	1.6	1.6
p-value	0.285	

t-Student test (p≤0,05)
Note: SD =standard deviation

In what refer to the communicative means, Table 2 shows the data of t-Student test about the proportion of use of the different communicative means in both rooms by all the subjects.

Table 2. Proportion of communicative means for each subject in both rooms

Subjects	Communicative means					
	Verbal (%)		Vocal (%)		Gestural (%)	
	Regular room	NIC room	Regular room	NIC room	Regular room	NIC room
1	0	0	9.55	5.92	90.45	94.08
2	47.58	35.36	3.49	8.71	48.92	55.94
3	0.00	1.32	20.95	22.37	79.05	76.32
4	1.94	1.14	31.07	27.84	66.99	71.02
5	0.00	0.78	25.00	26.07	75.00	26.07
6	73	52.01	6	3.82	87	44.17
7	49.48	46.08	5.57	3.59	44.95	50.33
8	0.00	0.00	38.23	38.50	61.77	61.50
9	42.17	36.63	3.48	2.06	54.35	61.32
10	38.53	41.54	3.82	6.15	57.65	52.31
Mean	23.7	21.5	14.3	14.5	62.0	64.0
SD	25.0	22.4	13.3	13.0	15.9	14.9
p-value	0.16		0.85		0.17	

t-Student test (p≤0.05)
Note: SD = standard deviation

Despite the differences observed in the use of communicative means by all subjects in the two rooms, there were no significant differences in this aspect. However the data confirm the great differences between subjects.

About the communicative functions, Table 3 shows the mean numbers of more interactive and less interactive communicative functions expressed by the subjects in both rooms. Just subject 3 presented a larger number of more interactive communicative functions in the NIC room.

Table 3. More and Less Interpersonal Communicative functions expressed by each subject in both rooms

	Communicative functions			
Subjects	More interpersonal (%)		Less interpersonal(%)	
	Regular room	NIC room	Regular room	NIC room
1	46	45	54	55
2	71	51	28	48
3	46	55	54	45
4	37	37	63	62
5	16	15	83	84
6	87	44	12	25
7	63	63	37	36
8	53	52	46	47
9	63	57	37	43
10	28	18	72	82
DP	21.05	16.09	21.17	18.80
Valor de p	0.15		0.15	

t-Student test (p≤0,05)
Note: SD = standard deviation

However, the analysis of the communicative functions has shown that there were also no significant differences between both rooms in what regards the proportion of communicative interaction.

DISCUSSION

Data obtained in this study allowed the description of the FCP of ASD children and adolescents in two environments of language therapy with different physical characteristics. This way, the analysis included the number of communicative acts per minute, the proportions of use of the communicative means and the proportions of more interactive and less interactive communicative functions expressed by them.

As the literature points out the context influences the children's language use[4,12,13], vocabulary and syntax[13]. Therefore, any language assessment or intervention must take into account the context in which the communication occurs[4,12,16,19].

Agreeing with the findings of the present study[14], other authors stated that ASD children respond to specific details but ignore the general context. In this study the environmental context didn't produce changes in their FCP suggesting the hypothesis that this fact may be related to the central coherence failures frequently observed in ASD[14].

In this research the physical context was the main focus of analysis while the interaction context was kept invariant, suggesting that the interactive context may have a more important influence on communication than the physical environment. As suggested by other study, different contexts generate differences in the FCP of ASD children during language therapy, but they may be more clearly related to differences in time and interlocutors and not just the physical environment[12]. It should also be considered that the influence of interaction context in the communicative performance as changes in interlocutors and different kinds of age appropriate games in normal children[25] and the provision of attention and joint play contexts during language therapy increase the experiences of communication efficacy[17].

These data may be related to the fact that in this research the variations exclusively associated to the physical context didn't interfere significantly on the FPC of ASD children and adolescents. These findings also confirm the statement that the great dispersion of results indicates the large individual variations that are characteristic of this population[16].

Other authors stated that in normal children with ages between 3 and 7 years the interpretation of vocal expressions by the interlocutor if affected in different ways in different contexts, including the environment[15]. Aspects of the physical context generate differences in adult-child communication, especially in language use[13], and in the expression of communicative functions[25-27]. Although this research didn't focus on these aspects, it can be supposed that the interpretation of the interlocutor's language didn't vary according to the physical environment since the functions verified are related to the communicative activity in itself.

It is also important to consider that this is a transversal study, that is, all the analysis refers to a short space of time, allowing the description of the several variables and their consistency in the subjects' communication characterization. However, even if no significant difference was observed in the overall group, most of the subjects presented higher means in the NIC room.

These data suggest that a longitudinal study about the interference of the physical environment, with the same methodological structure of the present research, may identify different results in the different contexts.

Besides, in the work with ASD children and adolescents it is useful to use contexts that are similar to regular social interaction settings as a way to improve language use in spontaneous situations once they are the main source of failure and interfere significantly in the social relations[4-8].

Even if these individuals have more abilities in identifying specific details and more trouble in dealing with general contexts[14], it is essential to present this kind of challenge during therapy because they are closely associated to the social interaction impairments[1,4,9] and to de behavioral disorders[10].

These findings reinforce the need of new studies about the language therapy's environmental context provided to ASD individuals and the physical aspects that are included in order to identify the better alternatives.

CONCLUSION

This study allowed the analysis of the Functional Com-

municative Profile of children and adolescents with Autism Spectrum Disorders in two therapeutic settings with different physical environments.

The physical structure of the environmental context didn't interfere significantly in the Functional Communicative Profile of the participants. The inclusion of other variables and a larger number of sessions is suggested as a way to determine the most adequate contexts and therapeutic strategies to these persons.

This way, the search for interventions models to children with Autism Spectrum Disorders still demands careful studies.

RESUMO

Objetivo: Analisar o perfil funcional da comunicação de crianças e adolescentes com distúrbios do espectro autístico em dois ambientes de terapia de linguagem, que se diferenciam quanto ao aspecto físico. **Métodos:** Participaram dez sujeitos com distúrbios do espectro autístico, seis do gênero masculino e quatro do gênero feminino, com idades entre 4 e 13 anos. Na coleta de dados, foram realizadas filmagens de oito sessões de terapia de linguagem individual com duração de 30 minutos, sendo quatro sessões em uma sala comum e quatro em uma sala com ambientação específica (sala NIC), intercaladamente, durante um mês. Para a análise dos dados foi empregado o Protocolo de Pragmática, e os resultados receberam tratamento estatístico. **Resultados:** Verificou-se que não houve diferença significativa entre o perfil pragmático apresentado pelos dez sujeitos na sala comum e na sala NIC. **Conclusão:** O contexto físico aqui estudado não influenciou significativamente no perfil funcional da comunicação de indivíduos do espectro autístico, ainda que se tenha verificado tendências individuais apresentando melhor desempenho em uma sala ou em outra.

Descritores: Linguagem; Transtorno autístico; Comunicação social; Estudos de intervenção; Criança; Adolescente

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