

Social-communicative adaptation and Autism Behavior Checklist: associations in the evolution of institutionalized adolescents with autism

Adaptação sócio-comunicativa e Autism Behavior Checklist: correlações com a evolução de adolescentes autistas institucionalizados

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ABSTRACT

Purpose: To verify the existence of correlation between the results found in the Functional Communicative Profile, the social-cognitive performance, the Autism Behavior Checklist, and the social-communicative adaptation along a period of six months. **Methods:** Participants were eight institutionalized adolescents with Autism Spectrum Disorders, assessed regarding their functional communicative profile and social-cognitive performance. Parents, caretakers and therapists answered the Social-Communicative Adaptation and the Autistic Behavior Checklist questionnaires in the beginning of the study and six months later. Data were statistically analyzed using non-parametric techniques. **Results:** Higher scores on the Autistic Behavior Checklist are associated to lower scores on social-cognitive performance and to lower number of communicative acts. **Conclusion:** There is association between the results in the Autistic Behavior Checklist and the functional communicative profile and the social-communicative performance, but the results in the social-communicative adaptation are not correlated with any of the other variables.

Keywords: Autistic disorder; Adaptation; Communication; Adolescent; Cognition; Language; Institutionalization

INTRODUCTION

Autism is a behavioral syndrome with unknown etiology, characterized by impairments in the areas of socialization, language and behavior. It is necessary to consider all these aspects when assessing language because it isn't possible to separate it from the organic, cognitive and social aspects of development⁽¹⁾.

Other research⁽²⁾ reports that one of the biggest challenges for autistic children is the social communication development.

Another previous study⁽³⁾ described that it is necessary to consider that language development occurs through the child's interaction with the environment. Therefore, language acquisition and socialization are mutually dependent. The author concludes in this study that the autistic individuals don't present proportional correlation between cognition, language and social development.

Another study⁽⁴⁾ commented that language changes and social and cognitive development indicate that cognitive and/or social disorders may trigger language disorders and vice versa. Other research⁽⁵⁾ concluded that social and affective damages in autism can combine with the cognitive deficits leading to a poor development in interactive play and thus resulting that the child doesn't experience the emotional, social and cultural cycle needed for a typical development.

Researchers⁽⁶⁾ mention that the skills needed to start and answer joint attention experiences present a significant relationship with language development and social relationships.

There are researchers that studied the social behavior and suggested that the disabilities in executive functions can explain some autistic behavior characteristics as the desire to maintain the sameness and the abnormal use of processing capacity⁽⁷⁾. However, other authors didn't find significant

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correlations between social intelligence and social abilities⁽⁸⁾.

Researches with adolescents with autism disorders observed that there is an increase in social interests⁽⁹⁾ and comment about the high anxiety levels this age group⁽¹⁰⁾. Other research described that the vocational failure and the social isolation experienced by autistic adolescents make most of them become highly dependent on others adults⁽¹¹⁾.

Others authors stated that there are significant and continuous improvements in social communication throughout the life of individuals with autism and that they are associated with improvements in the formal aspects of language and in theory of mind skills⁽¹²⁾.

Considering the need to think of autism as having a complete language system, this study assessed the language of institutionalized adolescents with autism using the Functional Communicative Profile (FCP)⁽¹³⁾; the Social-Cognitive Performance (SCP) in spontaneous and controlled situations⁽⁴⁾. The Social-Communicative Adaptation (SCA) was investigated based on parents' answers to a specific questionnaire⁽³⁾ and the behavior was investigated with the Autism Behavior Checklist (ABC)⁽¹⁴⁾ adapted to the Portuguese.

The purpose of this research was to verify the existence of correlations between the level of SCA and the FCP, SCP and ABC results at the baseline and after a 6-month period of institutionalized service.

The hypotheses suggested derive from the theoretical basis compiled and from clinical practice:

- There will be an observable and significant correlation between the level of the SCA identified in the baseline and the FCP and SCP results studied along the 6-month period;
- There will be an observable and significant correlation between the ABC scores in the baseline and the FCP and SCP results studied along the 6-month period;
- There will be an observable and significant correlation between the level of SCA and the ABC results and the FCP and SCP results studied along the 6-month period.

METHODS

The present study was approved by the Research Ethics Committee of Hospital das Clínicas, Faculdade de Medicina, Universidade of São Paulo with protocol number 0186/07.

Description of the research site

The site chosen for the research was a private Family Center, convened with the Secretary of Health of São Paulo State, which treats patients with autism with or without comorbidities and different age groups. The interdisciplinary team is composed by: psychologists, speech language pathologist, physical therapist, music therapist, psychomotor therapist, occupational therapist, family therapist and teachers. In addition to the technical team, there is a support team comprised by caregivers and psychology and pedagogy trainees.

The first author of this research works in this place since 1998 and is the responsible for the speech therapy service,

besides being the institution's therapeutic coordinator.

After site selection, the researcher has requested and obtained an institutional authorization for the research.

Subjects

The inclusion criteria for the study participants were: being aged within adolescence (between 12 and 16 years old); regularly and fully attend to the Center five days a week; participate in group speech language therapy; have been diagnosed with autism without co-morbidities by neurologist and/or psychiatrist according to CID-10 criteria⁽¹⁵⁾.

Following the inclusion criteria, only eight individuals were selected to be part of this research; so the small number of study subjects is justified by the pursuit of a greater homogeneity.

After the participants were identified, their parents were summoned to a meeting with the researcher, who reported the details about the research that would be developed and the parents who agreed signed a consent form.

Material

The study used the following protocols: Autism Behavior Checklist (ABC)⁽¹⁴⁾ ABC; Social-Communicative Adaptation scale (SCA)⁽³⁾; Functional Communicative Profile (FCP)⁽¹³⁾ and Social-Cognitive Performance (SCP)⁽⁴⁾.

To the Social-Cognitive Performance assessment, were used: individually interesting objects, a piece of cloth, a "bionic hand", a miniature stand that lights up, a miniature phone, dull pencils, a pencil sharpener, a trash bin, adhesive tape, a sheet of paper and miniature house with its furniture.

Other material used was: videotapes, DVDs, video cameras and computer.

Procedures

The procedures were divided into: those who were directly applied to the participants and those that were applied to their parents, therapists and caregivers. Initially we determined the period of data collection, determining that it would occur in three stages over a period of approximately six months.

This data was collected at three-month intervals that may not exceed three months and 15 days, allowing a longitudinal study of the communication profile of institutionalized adolescents with autism.

The data gathering of ABC and SCA was performed by the researcher only at the first data collection due to the presence of variables such as staff turnover in the institution and the divergence of responses due to this rotation.

On the same date of the first data collection, the participants' mothers and the five selected professionals of the Center, who worked directly with the subjects, answered the ABC and SCA protocols. The selected professionals that answered individually to the protocols were: speech language pathologist, occupational therapist, psychologist, psychologist trainee and the physical education teacher.

Procedure for the assessment of the Functional Communicative Profile⁽¹³⁾

To the FCP assessment the subjects were videotaped in spontaneous interaction, in their own group's refectory, where they were placed by an individual table during the lunch routine situation, while the researcher interacted with him or her and other professional or other patient filmed the interaction.

The choice of the spontaneous interaction situation, during a daily living activity aimed to ensure uniformity, avoiding interference in the daily routine of the individuals and taking advantage of the therapist's familiarity with the participants since previous studies reported that individuals with autism tend to respond better in natural, familiar environments⁽¹⁶⁾.

The duration of each sample was 15 minutes, according with a previous study⁽¹⁷⁾. These recordings were analyzed using the FCP protocol⁽¹³⁾.

Procedure for the investigation of the Cognitive Social Performance⁽⁴⁾

The SCP assessment was conducted in two situations: spontaneous (the same sample used to the FCP) and "test" and in the three data collection moments. The "test" situation occurred on the same day as the spontaneous situation recording.

In the "test" situation, the subjects interacted individually with the first author that presented the previously defined toys and proposed the pre-defined activities.

The SCP⁽³⁾ assessment verified the individual's better performance in each of the domains: gestural and vocal communicative, gestural and vocal imitation, tool use, combinatory play and symbolic play. The data were recorded on specific individual protocols and then transcribed to the data spreadsheet.

Procedure for the investigation with the Autism Behavior Checklist – ABC, adapted to the Portuguese⁽¹⁴⁾

The ABC scale is formalized in a record protocol with a total of 57 questions and they were applied to the subjects' mothers and selected professionals of the institution.

Initially, the researcher interviewed the mothers individually and applied the ABC protocol. Then, this same procedure was performed with the professionals who were involved in the treatment of subjects. Each answer (yes or no) was transcribed to a protocol.

Then, all the answers (mothers and professionals) were transcribed to a spreadsheet in order to find a single answer, that is, the largest number of "yes" or "no." The questions with positive responses had a score of 1 (one), negative responses scored 0 (zero) and the issues that mothers or professionals could not answer also scored 0 (zero). This response was only considered and scored according to the scores presented in the protocol itself when the response was positive. Then, we performed a total sum score of all answers to the 57 questions for each individual and this result was analyzed to verify whether the individual sum was equal or greater than 68, which places the individual within the autistic spectrum.

Procedure to the assessment of the Social-Communicative Adaptation⁽³⁾

The SCA scale consists of a questionnaire with 16 questions to observe the socialization and the functional communicative competence. Through the responses obtained in this scale it was possible to determine at what level of social communicative adaptation is the subject. This scale was applied to the mothers of the subjects and to the selected professionals.

Initially, the researcher interviewed the mothers individually and applied the ABC protocol. Then, this same procedure was performed with the professionals who were involved in the treatment of subjects. Each answer (yes or no) was transcribed to a protocol.

Then, all the answers (mothers and professionals) were transcribed to a spreadsheet in order to find a single answer, that is, the largest number of "yes" or "no." The questions with positive responses had a score of 1 (one), negative responses scored 0 (zero) and the issues that mothers or professionals could not answer also scored 0 (zero).

Finally, the end result was transcribed to a spreadsheet for analysis so that the results were displayed, and thus could determine the individual level of social-communicative adaptation.

To determine each participant's individual SCA, the level with the highest number of positive responses was identified. Participants who had fluctuating results at each level, ie, results ranging between zero and one scores were considered unstable.

Statistical analysis

The statistical analysis was performed to verify the existence of relationships between the data obtained. The statistical tests used were the non-parametric, having been developed for small samples.

The Friedman Test was used to compare paired groups; the significance level used was 5%, applied also to the Wilcoxon test comparisons and to the Chi-square test.

In addition, the Spearman Correlation Test was applied to evaluate the associations between all variables in this study. In this analysis the positive relationship indicates that when one variable increases the other also does and when there is a negative relationship it indicates that when one variable increases the other decreases. Based on these calculations it is possible to determine the values of the correlation coefficient (rho) Pearson, that verifies whether the association is strong or weak and if it is significant (p value). The correlation coefficients that indicate the strength of the relationship between two variables are described below and were interpreted according to the research proposal⁽¹⁸⁾: 0 to 0.25 = very low, 0.26 to 0.49 = low; 0.50 to 0.69 = moderate, 0.7 to 0.89 = high, 0.9 to 1.00 = very high.

RESULTS

To obtain the results, initially data were considered for the PFC and the SCP. After this, was calculated the mean,

median and standard deviation of the data referring to the SCP in the 3 data gathering situations (Table 1).

Table 2 presents the score for each participant in the ABC scale, considering the total score and the scores on each sub-area. The percentages shown were calculated from the total value and the absolute value assigned to each individual in each area.

The statistical comparison between the subareas of the ABC test resulted that the higher scores referred to the subareas of language and personal and social development.

Table 1. SCA in spontaneous and test situations in the three different moments

Collections	Situations	Mean	Median	DP	Z	p-value
1st moment	Test	19.50	21.50	6.61	-1.126	0.260
	Spontaneous	22.00	23,00	4.57		
2nd moment	Test	19.50	20,00	5.71	-0.940	0.347
	Spontaneous	22.13	22,00	6.81		
3rd moment	Test	22.75	26.50	8.99	-1.065	0.287
	Spontaneous	25.88	27.00	4.73		

Wilcoxon test (p≤0.05)

Note: DP = standard deviation; Z = Wilcoxon test

Table 2. Comparison between sub-areas of the ABC

ABC sub-areas	Mean	Median	SD	Friedman	Wilcoxon
SS	45.67	44.23	17.25		
RE	45.07	52.63	24.34		
BO	43.09	40.79	17.68	X2=13.600; ES, RE, CO < LG p=0.009*	ES, CO < PS
LG	69.76	69.35	10.19		
OS	70.00	68.00	16.70		

* Significant values (p≤0.05) – Friedman and Wilcoxon tests

Note: ABC = Autism Behavior Checklist; SS = sensory stimuli; RE = relating; BO = body and object use; LG = language; OS = social self-help; SD = standard deviation; X2 = Friedman Test; < = fewer behaviors than in the subarea

The individual scores in the SCA are shown in Chart 1.

Chart 1 shows that there is heterogeneity among subjects in their SCA level and three subjects are at level 2 which is the apprentice, where the subject may be in the stages of

Chart 1. Social-Communicative Adaptation level of each subject

Subjects	Social-communicative adaptation level
MF	2
LP	2
EL	Unstable
LO	Unstable
EB	2
GB	4
CH	4
GA	Unstable

tuning to other, building social references, student/guide or social coordination. Just two of the subjects are at level 4, that is the pioneer, where the subject may be at the stage of perspectives, shared imagination, sharing ideas and friends.

Table 3 presents the correlation analysis between the variables score on the ABC and on SCP in both situations. The results indicate that there is a strong negative association between the SCP score in the first moment in spontaneous situation and the results on the ABC. That is, the higher the score on the ABC, the lower the score on SCP.

Table 4 presents the correlation analysis between the ABC scores and the number of communicative acts produced per minute in the three moments of data gathering. The results indicate only a moderate negative correlation between ABC scores and the number of communicative acts per minute. That is, the higher the ABC score, the lower the number of communicative acts produced per minute.

Finally, Table 5 summarizes the data about the correlation analysis between ABC scores and the proportion of communicative acts with interpersonal functions. The results indicate that there are no significant associations.

DISCUSSION

The results obtained in the ABC sub-scales have shown that the subjects had higher scores, i.e., worse performance in the language, personal and social development areas. This result may be related to the fact that although the subjects presented evolution in the number of communicative acts, they still have not increased the use of interpersonal functions

Table 3. Correlation between social-cognitive performance in spontaneous and test situations and total score on the Autism Behavior Checklist in the three moments of data gathering

ABC	Social-cognitive performance					
	Test 1	Test 2	Test 3	Spontaneous 1	Spontaneous 2	Spontaneous 3
p-value (rho)	0.365 (-0.372)	0.131 (-0.582)	0.412 (-0.338)	0.030* (-0.756)*	0.165 (-0.542)	0.188 (-0.518)

* Significant values (p≤0.05) – Spearman correlation

Note: ABC = Autism Behavior Checklist; rho = Pearson correlation; Test 1 = social-cognitive performance in test situation in the first moment; Test 2 = social-cognitive performance in test situation in the second moment; Test 3 = social-cognitive performance in test situation in the third moment collection; Spontaneous 1 = social-cognitive performance in spontaneous situation in the first moment; Spontaneous 2 = social-cognitive performance in spontaneous situation in the second moment; Spontaneous 3 = social-cognitive performance in spontaneous situation in the third moment

Table 4. Correlation between the variables total score on the ABC and number of communicative acts produced per minute in the three moments

ABC	Communicatives acts per minute		
	Acts 1	Acts 2	Acts 3
p-value (rho)	0.544 (-0.254)	0.067 (-0.673)	0.272 (-0.443)

* Negative moderate associations – Spearman correlation ($p \leq 0.05$)

Note: rho = Pearson correlation; ABC = Autism Behavior Checklist; Acts 1 = communicative acts produced per minute in the first moment; Acts 2 = communicative acts produced per minute in the second moment; Acts 3 = communicative acts produced per minute in the third moment

Table 5. Correlation between the variables total score on the ABC and proportion of communicative acts with interpersonal functions in the three moments of data gathering

ABC	Functional communicative profile		
	Inter 1	Inter 2	Inter 3
p-value (rho)	0.711 (-0.158)	0.463 (0.305)	0.666 (-0.182)

* Spearman correlation ($p \leq 0.05$)

Note: rho = Pearson correlation; ABC = Autism Behavior Checklist; Inter 1 = interpersonal acts produced in the first moment; Inter 2 = interpersonal acts produced in the second moment; Inter 3 = interpersonal acts produced in the third moment

and that they maintain the cognitive and social framework that are typical of autism.

The studied subjects presented lower scores, ie, better performance in the sensorial, relationship, use of body and objects subareas; this fact can be justified because the subjects were institutionalized and the aspects of daily life and practice are worked daily, resulting in better performances in these subareas.

Also considering the scores presented by subjects in the sensorial and use of body and objects subareas when compared to the scores in personal and social developmental, this brings up the consideration that these subjects may present development when stimulated, but they retain their characteristic difficulties related to social skills.

The results of the assessment on the ABC are in accordance with the findings that autistic adolescents have increased social interest, but this doesn't necessarily mean an increase in social skills⁽¹¹⁾, as well as the fact that there are significant losses in non-verbal communication and social reciprocity⁽¹⁹⁾.

In what refer to the relationship between ABC and FCP, a previous study reported positive correlations between the total scores on the ABC and the use of gestural communicative means and the expression of non-interpersonal communicative functions and negative correlations with interpersonal communicative functions, ie, it concluded that the better the FCP, the lower the ABC score⁽²⁰⁾.

The findings of another research in relation to the predominance of gestural communicative means, non-interpersonal functions and the negative moderate correlation, between the number of communicative acts per minute and the ABC score, also agree with this study⁽²⁰⁾.

The association of non-interactive communicative functions and the autistic spectrum reported in another study⁽²⁰⁾ is also consistent with this research in which all subjects showed predominance of non-interpersonal functions, probably due to their social difficulties.

The variability in the SCA scores agrees with the findings described in other studies⁽²¹⁾ about the diversity of individuals with autism.

The observed improvements in cognition and language are associated with chronological age, individual development characteristics as improvements in social interaction and language skills between 10 and 15 years as described in another study⁽²²⁾.

In relation to the SCA, the result that only two of the eight subjects were described at level four is consistent with the findings of a research on increasing social interest in adolescents with autism. That doesn't mean that it results on an increase in social skills⁽⁹⁾ what may explain the high levels of anxiety present in adolescents with autism due to their inability social⁽¹⁰⁾.

As for the negative correlation between the ABC and the SCP, the higher the ABC scores, the lower the scores in SCP. It may be related to the fact that the greater the severity the less opportunities for experiences that promote cognitive development are presented to the child.

Another factor in relation to the negative correlation between the ABC score and the SCP is the report that verbal and non-verbal intelligence are already stabilized at this age, ie, this negative correlation wouldn't be due to the autism severity itself, but to the developmental period⁽²³⁾. On the other hand, contradicting this statement, there are studies describing improvements in executive functions over time⁽²⁴⁾.

The SCA results of this research are in agreement with previous findings that there isn't a positive correlation between the cognition, language and socialization areas in autistic subjects⁽³⁾.

Several studies^(4,25-27) has shown the relationships among the symptoms of autism and the need to consider these relationships in therapeutic intervention as well as considering the subject with autism in a complete linguistic system⁽¹⁾.

It is observed that the ABC results, as well as the SCA's point out to the question of the heterogeneity of the autism phenotype, which has been mentioned in previous studies⁽²⁸⁻³⁰⁾.

CONCLUSION

The present study proposed three hypotheses. The first hypothesis wasn't confirmed, as it was observed that a higher level of SCA doesn't determine the best performance and/or more evolution in the FCP and SCP.

The second hypothesis was confirmed in relation to SCA since the highest score on SCA is related to lower scores of SCP and to the production of fewer communicative. However, no significant associations were observed between ABC scores and the proportion of communicative acts with interpersonal.

The third hypothesis wasn't confirmed since it was ob-

served that higher or lower ABC scores do not determine greater or lesser levels of SCA. Accordingly, the SCA level didn't influence the FCP or the SCP scores.

It is suggested that similar studies with a larger number of subjects are proposed so they can expand these data and confirm or deny the results.

RESUMO

Objetivo: Verificar a existência de correlação entre os resultados encontrados no Perfil Funcional da Comunicação, o desempenho sócio-cognitivo, o *Autistic Behavior Checklist* e a adaptação sócio-comunicativa ao longo de seis meses. **Métodos:** Foram sujeitos dessa pesquisa oito adolescentes autistas institucionalizados que foram avaliados quanto ao perfil funcional da comunicação e desempenho sócio-cognitivo. Os pais, terapeutas e cuidadores da instituição responderam aos questionários de Adaptação Sócio-Comunicativa e da *Autistic Behavior Checklist* no início da pesquisa e seis meses depois. Os dados obtidos foram submetidos à análise estatística não paramétrica. **Resultados:** A maior pontuação no *Autistic Behavior Checklist* está relacionada a menores escores no desempenho sócio-cognitivo e menor número de atos comunicativos. **Conclusão:** Houve correlações entre os resultados da *Autistic Behavior Checklist* e o perfil funcional da comunicação e o desempenho sócio-cognitivo, mas os resultados da adaptação sócio-comunicativa não se correlacionaram com nenhuma das variáveis.

Descritores: Transtorno autístico; Adaptação; Comunicação; Adolescente; Cognição; Linguagem; Institucionalização

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