

ATYPICAL BEHAVIORS OF CHILDREN AND ADOLESCENTS WITH ASD AND  
OTHER DISORDERS: EFFECTS OF AN INTERVENTION

*COMPORTAMENTOS ATÍPICOS DE CRIANÇAS E ADOLESCENTES COM TEA E  
OUTROS TRANSTORNOS: EFEITOS DE UMA INTERVENÇÃO*

*COMPORTAMIENTOS ATÍPICOS DE NIÑOS Y ADOLESCENTES CON TEA Y  
OTROS TRASTORNOS: EFECTOS DE UNA INTERVENCIÓN*



Thaís YAZAWA<sup>1</sup>  
e-mail: tatayazawa@gmail.com



Fabiola COLOMBANI<sup>2</sup>  
e-mail: fabiolacolombani@unimar.br



Gelci SAFFIOTTE ZAFANI<sup>3</sup>  
e-mail: gelciszafani@gmail.com

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<sup>1</sup> São Paulo State Court of Justice (TJSP), Lencóis Paulista – SP – Brazil. Psychologist in the Judiciary. Doctoral degree in Developmental and Learning Psychology (UNESP).

<sup>2</sup> University of Marília (UNIMAR), Marília – SP – Brazil. Faculty and internship supervisor for the Psychology Course and Coordinator of the Psychology Clinic. Doctoral degree in Education (UNESP).

<sup>3</sup> University of Marília (UNIMAR), Marília – SP – Brazil. Faculty and internship supervisor for the Psychology Course. Master's degree in Education (UNESP).

**ABSTRACT:** Atypical behaviors, destructive behaviors, self-injury, or compulsions can hinder the inclusion of children in schools. Several instruments are used to assess the occurrence and frequency of these behaviors, including the Aberrant Behavior Checklist (ABC), to evaluate whether the procedures implemented have successfully increased the frequency of more appropriate behaviors. Eighteen professionals used the ABC to assess the behaviors of their patients and students after a Behavioral Analysis teaching program. The program aimed to teach professionals how to manage atypical behaviors, reducing their occurrence and increasing the occurrence of other socially desirable behaviors. In pre and post-tests, a significant difference was observed in all domains listed in the ABC, implying that the occurrence of atypical behaviors decreased after participants engaged with the teaching program, with teachers achieving the best results in the post-test.

**KEYWORDS:** Education. Psychology. Behavior Analysis.

**RESUMO:** *Comportamentos atípicos, comportamentos destrutivos, autolesão ou manias podem dificultar a inclusão de crianças nas escolas. Para avaliar a emissão e frequência destes comportamentos, alguns instrumentos são utilizados, entre eles, o Aberrant Behavior Checklist (ABC), com o objetivo de avaliar se os procedimentos realizados tiveram êxito para aumentar a frequência de comportamentos mais adequados. Dezoito profissionais utilizaram o ABC para avaliar os comportamentos de seus pacientes e alunos após um programa de ensino em Análise do Comportamento, com o objetivo de ensinar os profissionais a gerenciarem os comportamentos atípicos, diminuindo a emissão destes e aumentando a emissão de outros comportamentos socialmente mais desejáveis. Em avaliação pré e pós-teste, foram obtidos diferença significativa em todos os domínios listados no ABC, inferindo que a emissão dos comportamentos atípicos diminuiu após os participantes entrarem em contato com o programa de ensino, sendo as professoras as participantes com melhores resultados no pós-teste.*

**PALAVRAS-CHAVE:** *Educação. Psicologia. Análise do Comportamento.*

**RESUMEN:** *Los comportamientos atípicos, los comportamientos destructivos, las autolesiones o las manías pueden dificultar que los niños sean incluidos en las escuelas. Para evaluar la emisión y frecuencia de estos comportamientos, se utilizan algunos instrumentos, entre ellos, el Aberrant Behavior Checklist (ABC), con el objetivo de evaluar si los procedimientos realizados fueron exitosos para aumentar la frecuencia de comportamientos más apropiados. Dieciocho profesionales utilizaron el ABC para evaluar los comportamientos de sus pacientes y estudiantes después de un programa de enseñanza en Análisis de Comportamiento, con el objetivo de enseñar a los profesionales a manejar comportamientos atípicos, reduciendo la emisión de estos y aumentando la emisión de otros comportamientos más deseables socialmente. En la evaluación pre y post prueba, se obtuvo una diferencia significativa en todos los dominios listados en el ABC, infiriendo que la emisión de comportamientos atípicos disminuyó después de que los participantes entraron en contacto con el programa de enseñanza, siendo los profesores los participantes con mejores resultados en la prueba posterior.*

**PALABRAS CLAVE:** *Educación. Psicología. Análisis de Comportamiento.*

## Introduction

Some behaviors can draw attention due to their high frequency, causing physical harm to oneself or others, such as destructive behaviors, self-injury, or compulsions. Iwata *et al.* (1994) described self-injury as a chronic form of atypical behavior, posing severe risks to those who engage in it, presenting a challenge for their caregivers.

Such behaviors can interfere with academic learning and acquiring behavioral repertoires adapted to social demands (FORNAZARI, 2005). Teachers working with individuals with Autism Spectrum Disorder (ASD) rely on their knowledge to better understand and effectively engage with the mentioned audience (SHAW, 2021). They must comprehend the relationship between these behaviors and the environment to do so.

Atypical behaviors can serve a communicative function. For instance, self-injurious behavior may be a way to express "Pay attention to me" or "Leave me alone" (DONNELLAN *et al.*, 1984). According to Zarcone *et al.* (2001), atypical behaviors exhibited by individuals with intellectual disabilities hinder rehabilitation and require intensive, high-cost treatment. Furthermore, they remain relatively understudied.

Symptoms of ASD include delayed speech acquisition, stereotypy, and self-injury, which become more pronounced with the severity of the condition (MATSON; NEBEL-SCHWALM, 2007). These deficits hinder individuals from accessing broader environments that enable learning socially desirable behaviors, thereby facilitating productive social interactions. However, atypical behaviors are present in the behavioral repertoire of individuals with Down syndrome, severe intellectual disabilities, and other disorders (BARALDI, 2016; FORNAZARI *et al.*, 2014). Programs can assist professionals in teaching new and adapted behaviors to individuals with these disorders while extinguishing undesirable behaviors (LOVAAS, 1987). The author also emphasizes the need to identify and objectively observe these behaviors. To achieve this, it is necessary to use tools that aid in quantifying the frequency or intensity of atypical behavior emissions, thereby establishing a baseline that would allow for monitoring changes or regressions in atypical behavioral patterns post-intervention.

The *Aberrant Behavior Checklist* (ABC) (AMAN *et al.*, 1985) assesses the occurrence and frequency of atypical or aberrant behaviors in individuals with moderate or severe intellectual disabilities. In Brazil, it was adapted by Losapio *et al.* (2011). This instrument serves as a reference for evaluating clinical progress, potentially guiding the strategies employed and providing insights for intervention strategies development.

Research has utilized the ABC to compare atypical behaviors in individuals with Down syndrome, Prader-Willi syndrome, and ASD (SALEHI *et al.*, 2018) and to assess the relevance of the instrument in evaluating the behavioral repertoire of Mexican patients with ASD (SOTO *et al.*, 2018).

Other authors (AMAN *et al.*, 2020; GERALDO, 2017; KAAT; LECAVALIER; AMAN, 2013; KERR *et al.*, 2014; NORRIS *et al.*, 2019) have employed the instrument to evaluate procedures and behavioral assessments with or without the use of medication in various social and educational contexts. Thus, considering the behavioral repertoire of children and adolescents can provide insights for intervention programs and subsequently validate their effectiveness. Despite its adaptation for use in Brazil, the ABC has not been employed in studies assessing the efficacy of interventions for individuals with disabilities or ASD who exhibit complaints of atypical behavior. Instead, it has been used alongside instruments to validate other scales assessing severe behavioral problems (GERALDO, 2017; BARALDI, 2016).

In the study by Bierman and Erath (2004), the authors asserted that socioemotional skills can be developed through protocols and systematic use of instructions and models, providing opportunities for feedback and reinforcement of positive social practices and support for generalized use in other social contexts.

The ABC can serve as an instrument to assess changes resulting from implementing programs aimed at altering the behaviors of professionals that will impact the behaviors of their patients with disabilities, thereby facilitating their learning and socialization.

## **Objectives**

### **General**

This study aimed to describe and compare the characterization of atypical behaviors in patients diagnosed with Autism Spectrum Disorder (ASD) and other disorders before and after an intervention program on behavioral management for Healthcare and Education professionals.

## Specifics

a) Compare and describe atypical behaviors of all children in the sample (ASD and other disorders) in individual therapy before and after an intervention program on behavioral management conducted by Healthcare and Education professionals.

b) Compare and describe atypical behaviors of children in two groups: one with ASD (G1) and the other with other disorders (G2), both receiving individual therapy before and after an intervention program on behavioral management conducted by Healthcare and Education professionals.

c) Compare atypical behaviors of children with ASD and various disorders in individual therapy, divided into two groups: one composed of healthcare professionals and the other of education professionals, before and after an intervention program on behavioral management.

## Method

### Participants

This study involved 18 Healthcare and Education professionals (speech therapists, physiotherapists, psychologists, nurses, occupational therapists, and pedagogues) working in various cities in the interior of São Paulo.

The participants in the research were 100% female, with the majority (50%) being over 41 years of age. Teachers (33.3%) comprised the largest group among the training participants, followed by psychologists (22.2%), occupational therapists and physiotherapists (16.6%), and speech therapists (11.1%). Regarding additional education, 83.3% had completed specializations, and 38.8% had taken short courses. Concerning their years of experience in the field, 50% had more than six years of experience. Of these, 38.8% stated they were unfamiliar with Behavior Analysis.

**Table 1 – Sociodemographic Data of Participants**

Aspects	N	%
<b>Gender</b>		
Male	0	0
Female	18	100%
<b>Age</b>		
From 24 to 31 years	4	22,2%
From 32 to 40 years	5	27,7%
41 years or more	9	50,1%

<b>Education</b>		
<b>Pedagogy</b>	6	33,3%
<b>Occupational Therapy</b>	3	16,6%
<b>Physiotherapy</b>	3	16,6%
<b>Speech Therapy</b>	2	11,1%
<b>Psychology</b>	4	22,2%
<b>Additional Education</b>		
<b>Specialization</b>	15	83,3%
<b>Short Courses</b>	7	38,8%
<b>Years of Experience in the Field</b>		
<b>0 to 5 years</b>	8	44,4%
<b>6 to 15 years</b>	9	50%
<b>More than 15 years</b>	1	5,5%
<b>Familiar with Behavior Analysis?</b>		
<b>Yes</b>	11	61,11%
<b>No</b>	7	38,8%

Source: Authors' elaboration, 2020

The patients from the institutions selected by the professionals have their sociodemographic data described in Table 2. The researcher's guidance for patient selection was to choose the child who exhibited the most atypical behaviors. Of these patients, 77.7% were boys aged between 1 and 10 years (77.7%). Most of the sessions were recent (72.2% within one month to one year). The sessions were predominantly outpatient (66.6%), meaning that the patients attended other schools and received specialty services at that institution. Autism Spectrum Disorder (ASD) was the most frequent diagnosis (66.6%), often with different comorbidities. Intellectual disability was the second most common diagnosis (22.2%), followed by Down syndrome (16.6%).

**Table 2 – Sociodemographic Data of Patients**

	<b>N</b>	<b>Other Disorders</b>	<b>ASD</b>	<b>%</b>
<b>Gender</b>				
<b>Male</b>	14	3	11	77,7%
<b>Female</b>	4	3	1	22,2%
<b>Age</b>				
<b>1 to 10 years</b>	14	5	9	77,7%
<b>11 to 15 years</b>	3	1	2	16,6%
<b>16 years or more</b>	1	0	1	5,5%
<b>Length of Service</b>				
<b>0 months to 1 year</b>	13	4	9	72,2%
<b>1 year to 5 years</b>	4	2	2	22,2%
<b>More than 5 years</b>	1	0	1	5,5%
<b>Service Modality</b>				
<b>Outpatient</b>	12	6	7	66,6%
<b>School</b>	6	0	5	33,3%
<b>Diagnosis Type</b>				
<b>Autism (TEA)</b>	12			66,6%
<b>Intellectual Disability</b>	2			11,1%

Moderate Intellectual Disability and Down Syndrome	1	5,5%
Down Syndrome	1	5,5%
Epilepsies and Epileptic Syndromes and Mixed Developmental Disorder	1	5,5%
Organic Psychosis (F.29)	1	5,5%

Source: Authors' elaboration, 2020

## Location

The data were collected in individual therapy rooms within the institutions where the participating professionals originated from to ensure the collected information's confidentiality.

## Instruments and materials

a) Questionnaire for gathering sociodemographic data of professionals and patients/student.

The protocol consists of 19 questions, including name, date of birth, gender, marital status, educational background, field of practice, years of experience in this field, tenure at the institution where they work, undergraduate degree, specializations, professional development courses, short courses, and familiarity with Behavior Analysis. Regarding the patient attended by the participant, the collected data included the child/patient's name, age, gender, duration of therapy with the child/patient, therapy modality at the institution, and the child/patient's diagnosis.

b) The Aberrant Behavior Checklist (ABC) by Aman *et al.* (1985), standardized in Brazil by Losapio *et al.* (2011), was used for the identification of atypical behaviors. It is a scale of 58 items designed to assess the presence and severity of various behavioral problems in individuals with severe intellectual disabilities. Each item is assessed on a scale of 0 (no problems), 1 (few problems), 2 (moderately serious problems), and 3 (severe problems). The items are grouped into five domains: Irritability, Agitation, and Crying (15 items); Lethargy and Social Withdrawal (16 items); Stereotyped Behavior (7 items); Hyperactivity (16 items); and Inappropriate Speech (4 items). Statistical analyses have demonstrated that the ABC possesses strong psychometric properties, with high internal consistency among subscales ( $\alpha = 0.91$ ),

excellent test-retest reliability ( $r = 0.98$ ) moderate correlation with measures of adaptive behavior ( $r = 0.60$ ) (AMAN *et al.*, 1985).

b) Educational Material: Severe behavioral problems in healthcare settings: how to deal with them?

The instructional material *Severe behavioral problems in healthcare settings: how to deal with them?* (YAZAWA; FORNAZARI; RODRIGUES, 2018), adapted from Yazawa and Fornazari (2015), comprises three modules totaling 70 pages of texts and both essay and multiple-choice exercises for self-assessment with self-correction.

## **Procedure**

### **Data Collection**

The researcher contacted the institutions that provide care for children with intellectual disabilities. The participating professionals were briefed about the project and what their involvement would entail at its various stages. After the project presentation, with its phases described and any doubts resolved, ethical formalities were observed, and the professionals completed the sociodemographic protocol and the ABC. Subsequently, Module 1 material was provided, along with instructions on finishing it, and a mutually agreed-upon timeframe was set for the module's assessment. After the evaluation and achieving an 80% accuracy criterion, the participant received Module 2 material. If the 80% criterion were not met in the Module 1 assessment, a new timeframe for evaluation would be arranged. The same procedure was used for Modules 2 and 3, which culminated in an overall program evaluation. After the final assessment, the participants completed the ABC again for their patients.

### **Data Analysis**

For the correction of the ABC, the manual establishes maximum scores for each item in the different domains. In the Irritability domain, participants can score up to a maximum of 45, in Lethargy, 48; in Stereotypy, 21; in Hyperactivity, 48; and in Inappropriate Speech, 12. When describing the ABC results, the maximum score for each domain or domain item was considered for the 18 participants. The average data from the pre and post-tests obtained with the ABC (within-group) before and after the course were compared using the Wilcoxon test.



## Results

Table 3 displays the comparison between pre and post-tests based on the average scores in each domain assessed by the instrument. A statistically significant change in professional assessment is observed between the two time points in four out of the five estimated parts: Irritability ( $p=0,000$ ); Lethargy ( $p=0,003$ ); Stereotypy ( $p=0,019$ ) and Hyperactivity ( $p=0,002$ ). The dimension of Inappropriate Speech saw a decrease in the average score from pre to post-test, but the difference was not significant.

**Table 3** – Comparison of differences between pre and post-moments in the overall sample – Wilcoxon

	Pre Mean	Post Mean	Z	P
<b>Irritability</b>	22,1	12,8	-3,530 <sup>b</sup>	0,000
<b>Lethargy</b>	15,5	8,7	-3,011 <sup>b</sup>	0,003
<b>Stereotypy</b>	4,6	2,1	-2,351 <sup>b</sup>	0,019
<b>Hyperactivity</b>	33,1	20	-3,159 <sup>b</sup>	0,002
<b>Inappropriate Speech</b>	6,0	3,7	-1,794 <sup>b</sup>	0,073

Source: Authors' elaboration, 2020

Considering the significant number of children and adolescents with ASD ( $n=12$ ), we chose to analyze the data from this group by comparing them to the other participants with different disorders. The comparison of group medians in the pre and post-evaluations is presented in Table 4. In all domains, significant differences were observed from one moment to another in the group of children with ASD.

**Table 4** – Comparison between children with ASD at two-time points, pre and post-training

	Pre Mean	Post Mean	P
<b>Irritability</b>	25,18	13,45	0,005
<b>Lethargy</b>	21,09	11,36	0,008
<b>Stereotypy</b>	6	2,09	0,011
<b>Hyperactivity</b>	34,82	19,72	0,014
<b>Inappropriate Speech</b>	6,55	3,18	0,038

Source: Authors' elaboration, 2020

Considering the group of children with other disorders, only the domain of Irritability showed a significant difference between the two-time points, pre and post-intervention ( $p=0,041$ ), as shown in Table 5.

**Table 5** – Comparison between children with other disorders at two-time points, pre, and post-course

	Pre Mean	Post Mean	P
<b>Irritability</b>	17,29	12	0,041
<b>Lethargy</b>	6,86	4,57	0,246
<b>Stereotypy</b>	2,43	2,28	0,892
<b>Hyperactivity</b>	30,43	20,42	0,051
<b>Inappropriate Speech</b>	5,29	4,57	0,684

Source: Authors' elaboration, 2020

Comparisons were made between the two professional groups to assess whether healthcare and education professionals evaluated children differently and whether evaluations changed after the course. The sample included 12 healthcare professionals and six education professionals. The Mann-Whitney test was utilized to compare the mean scores of pre and post-tests for education professionals. The results indicated a significant difference in this group between the pre and post-tests in four out of five domains, with lower averages in the post-test for all fields (Table 6).

**Table 6** – Comparison of education professionals at two-time points, pre and post-intervention

	Irritability	Lethargy	Stereotypy	Hyperactivity	Inappropriate Speech
<b>Pre Mean</b>	30,33	17,67	5,50	39,67	7,67
<b>Post Mean</b>	14,16	5,16	0,666	20,50	3,16
<b>P</b>	<b>0,027</b>	<b>0,027</b>	<b>0,041</b>	<b>0,046</b>	0,078

Source: Authors' elaboration, 2020

Similar to the teachers, healthcare professionals (n=12) exhibited a decrease in scores in all domains, albeit with a smaller variation. Considering the differences in mean scores from pre to post for the group of healthcare professionals, as shown in Table 7, significant differences were observed in the domains of Irritability (p=0,006) and Hyperactivity (p=0,011).

**Table 7** – Comparison of healthcare professionals at two-time points, pre, and post-course

	Irritability	Lethargy	Stereotypy	Hyperactivity	Inappropriate Speech
<b>Pre Mean</b>	<b>18,00</b>	14,50	4,17	<b>29,83</b>	5,25
<b>Post Mean</b>	<b>12,25</b>	10,50	2,91	<b>19,75</b>	4,0
<b>P</b>	<b>0,006</b>	0,055	0,206	<b>0,011</b>	0,476

Source: Authors' elaboration, 2020

## Discussion

Atypical behaviors can hinder the socialization and education process of the children who exhibit them (FORNAZARI, 2005), due to their high frequency or "strangeness" (FORNAZARI, 2000). When considering the total sample, the most observed behaviors in this study were those related to Irritability, Hyperactivity, and Inappropriate Speech. These behaviors are related to self-injury and hetero-aggression (from the Irritability domain), described by Lovaas (1987), Matson and Nebel-Schwalm (2007) and Zarcone *et al.* (2001) as atypical behaviors often present in the repertoire of individuals with severe intellectual disabilities. The behaviors in these domains were also commonly found in children with ASD in the studies by Aman *et al.* (2009) and Ishii *et al.* (2017).

According to Kaat, Lecavalier and Aman (2013), who validated the ABC in the United States and Canada, a low frequency of adaptive behaviors is associated with high Irritability, Hyperactivity, Lethargy, and Stereotypy, domains with high scores in this study but decreased in frequency after the professionals participated in the intervention program. In addition to the observed hyperactive behavior, another domain, that of inappropriate speech, which also appeared relatively frequently in the sample of this study, is a standard repertoire in children with ASD (DONNELLAN *et al.*, 1984; MATSON; NEBEL-SCHWALM, 2007). The ABC proved to be an effective tool for assessing the occurrence and frequency of atypical behaviors, indicating the effectiveness of the intervention conducted, corroborating the results obtained by Aman *et al.* (2009), who used it to quantify the improvement in behavioral patterns after behavioral modification strategies and medication use.

The number of children and adolescents with ASD has been increasing in the population in recent years (MATSON; KOZLOWSKI, 2011), and this fact is also evident in this study. This population exhibits behaviors that hinder interaction and, likely for this reason, represents the majority of patients chosen by professionals. Out of the 18 participants, 12 were autistic, allowing for the separate data analysis from this group and patients with other disorders. Irritability, Hyperactivity, and Inappropriate Speech domains appeared in the pre-test for 50% or more of the ASD sample. Studies conducted with this population have also shown a high frequency of such behavior in children and adolescents with ASD (DONNELLAN *et al.*, 1984; LOVAAS, 1987; MATSON; NEBEL-SCHWALM, 2007; SALEHI *et al.*, 2018). Although these behaviors remained proportionally higher than the other domains, they decreased significantly after the intervention. Aman *et al.* (2009) and Schmidt *et al.* (2013) also observed

a decrease in the frequency of inappropriate behaviors in children with ASD after intervention using behavioral intervention and behavioral intervention combined with Risperidone.

Considering the behaviors of the group of children with other disorders, Hyperactivity, Inappropriate Speech, and Irritability were the most frequent domains in the pre-test and the post-test. An interesting finding was that, despite decreasing proportionally, the changes were only significant for Irritability. One possibility is that the repertoire of behavioral management that professionals learned may have been more effective in dealing with children with ASD than with other disorders, which can exhibit very different behaviors among them. Ishii *et al.* (2017) found these behaviors in children with ASD and Prader-Willi syndrome.

Considering the specificity of individualized care for healthcare professionals and small-group sessions for education professionals, we analyzed the results separately. The behaviors most observed by teachers in both the pre-test and post-test were Hyperactivity, Irritability, and Inappropriate Speech, and all studied domains significantly decreased from the pre-test to the post-test, except for Inappropriate Speech.

Healthcare professionals exhibited lower frequency in all domains, even in the pre-test, compared to teachers. However, the highest frequency in the pre-test and post-test was for the exact domains (Hyperactivity, Irritability, and Inappropriate Speech), with a significant decrease in Hyperactivity and Irritability. The data suggest a greater effectiveness of use for education professionals.

### **Final considerations**

The present study observed that healthcare and education professionals significantly reduced the frequency of atypical behaviors in both the total sample and subgroups (children with ASD and those with other disorders) after participating in a behavioral management course based on Applied Behavior Analysis. Furthermore, it was found that the system was more effective for education professionals than for healthcare professionals. As a limitation of the study, the variability in both the disorders and the professionals involved and the sample size prevents generalizations from being made based on the collected data.

However, the results obtained with the ABC indicated that the course appeared efficient, as participants reported changes in the frequency of atypical behaviors post-course, highlighting its effectiveness. For future studies, it is suggested that, in addition to universal course proposals

that can address different needs, a portion of the course could address specific complaints of professionals.

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