

**PSYCHOLOGY AND EDUCATION: BEHAVIORAL MANAGEMENT AS PRAXIS
AND STUDY STRATEGY FOR ASD**

**PSICOLOGIA E EDUCAÇÃO: O MANEJO COMPORTAMENTAL COMO PRÁXIS E
ESTRATÉGIA DE ESTUDO PARA O TEA**

**PSICOLOGÍA Y EDUCACIÓN: MANEJO DEL COMPORTAMIENTO COMO
PRÁCTICA Y ESTRATEGIA DE ESTUDIO DEL TEA**



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ABSTRACT: The primary objective of this article is to delve into behavioral management grounded in Behavior Analysis, aiming to stimulate reflective praxis and a thorough exploration of Autism Spectrum Disorder (ASD). Employing the methodology of the Aberrant Behavior Checklist (ABC) and pre-and post-test filming, the study aimed to outline and compare the frequency of appropriate and inappropriate behaviors among children displaying atypical behavior in individual care. Additionally, it sought to assess the appropriate and improper behavioral repertoire of education and health professionals in handling these behaviors before and after participating in a training program centered on developing effective management strategies. The results yielded positive outcomes, demonstrating a significant increase in appropriate behaviors and a noteworthy decrease in inappropriate behaviors among professionals and the children involved.

KEYWORDS: Psychology. Education. Behavioral management. ASD.

RESUMO: Este artigo tem como principal propósito discutir acerca do manejo comportamental baseado na Análise do Comportamento com o intuito de suscitar a reflexão para uma práxis e um estudo aprofundado sobre o Transtorno do Espectro Autista (TEA). Por meio da metodologia adotada utilizando o Aberrant Behavior Checklist (ABC) e filmagens pré e pós-teste, foi possível descrever e comparar a frequência de comportamentos adequados e inadequados de crianças que apresentavam atipias em atendimentos individuais e, o repertório comportamental adequado e inadequado de profissionais da educação e da saúde no manejo destes comportamentos, antes e depois da participação em um programa de ensino baseado na forma de desenvolver o manejo. Os resultados foram positivos na medida em que houve um aumento significativo de comportamentos adequados e uma diminuição significativa de comportamentos inadequados tanto dos profissionais, quanto das crianças envolvidas.

PALAVRAS-CHAVE: Psicologia. Educação. Manejo comportamental. TEA.

RESUMEN: El objetivo principal de este artículo es discutir el manejo conductual basado en el Análisis de Conducta con el objetivo de incentivar la reflexión para la praxis y el estudio en profundidad del TEA. A través de la metodología adoptada utilizando el Aberrant Behavior Checklist (ABC) y filmaciones pre y post-test, fue posible describir y comparar la frecuencia de conductas apropiadas e inapropiadas de los niños que presentaron atipia en el cuidado individual y el repertorio conductual apropiado e inapropiado. de los profesionales de la educación y la salud en el manejo de estas conductas, antes y después de participar en un programa de enseñanza basado en cómo desarrollar la gestión. Los resultados fueron positivos ya que hubo un aumento significativo de conductas apropiadas y una disminución significativa de conductas inapropiadas tanto por parte de los profesionales como de los niños involucrados.

PALABRAS CLAVE: Psicología. Educación. Manejo del comportamiento. TEA.

Introduction

The behavioral assessment procedure is an instrument that contributes to the support of modifying atypical or inappropriate behaviors. However, it is necessary to observe, comprehend, and analyze the target behavior for change (MILTENBERGER, 2018). According to Miltenberger (2018), behavioral assessment provides information to verify the effectiveness of treatment and whether there have indeed been behavioral changes. In direct examination, behavior is observed and recorded as it occurs using recording methods. It is possible to identify their function through observation and initiate appropriate behavioral modification strategies for atypical behaviors.

Among the most frequently described behavioral intervention strategies in the literature are functional analysis and differential reinforcements. According to Boutot and Tincani (2009), among the differential reinforcements are the *Differential Reinforcement of Alternative Behavior* (DRA), *Differential Reinforcement of Incompatible Behavior* (DRI), and *Differential Reinforcement of Other Behavior* (DRO). A specific alternative behavior is chosen and reinforced immediately after its occurrence in DRA. In this case, it does not necessarily have to be topographically incompatible with the behavior intended for extinction or reduction in frequency. In DRI, incompatible and appropriate behaviors are reinforced, considering the behavior to be extinguished. In DRO, another behavior emitted, different from the inappropriate behavior, will be supported at the time of its occurrence.

Cowdery, Iwata and Pace (1990) drew attention to the importance of differential reinforcements for the reduction of self-injury. Their study involved a nine-year-old boy, Jerry, who exhibited self-injurious behavior. When hospitalized, Jerry was treated with punishment (brief application of ice contingent on scratching), which reduced self-injury by 30%. In the first phase, data were collected for the baseline of functional analysis to identify the functional properties of Jerry's self-injury. This phase was conducted following the model of a previous study (IWATA *et al.*, 1994), using four conditions: attention, demand, alone, and play, with the addition of one more condition, along with toys.

In analyzing the results, Jerry engaged in self-scratching when he was alone. Self-injury did not occur in any of the other conditions. These findings suggest that other forms of stimulation (social interaction, toys, academic activities) served as effective distractors for self-injury, providing conditions for concurrent behavior. Thus, the second phase of treatment commenced, utilizing tokens in a Differential Reinforcement of Other Behavior (DRO) schedule, conducted with Jerry alone in a room without access to toys. The therapist informed

Jerry that he would "leave the room for a few minutes and should not scratch himself." If Jerry refrained from self-scratching and exhibited other appropriate behavior, he earned a token and social reinforcers. Ultimately, Jerry was allowed to exchange the tokens for access to TV, snacks, video games, and other materials. Self-injurious behavior was reduced to zero, returning to rates of 78% when the procedure was reversed.

Procedures developed by Behavior Analysis (BA) can be applied within classrooms and individual counseling settings. DiGennaro, Martens and Kleinmann (2007) implemented teaching procedures for teachers and emphasized that using evidence-based practices is particularly crucial when a psychologist collaborates with the teacher in planning, implementing, and evaluating an intervention plan for the student. Furthermore, the authors stated that the responsibility for the intervention plan primarily lies with the teacher, requiring them to acquire new skills to be incorporated into their academic repertoire.

Psychology is a science that has much to contribute to educators (HENKLAIN; CARMO, 2013) but many barriers and labels still exist. Behavior Analysis, due to the unfamiliarity with its principles, has been considered technocratic and reductionist towards humans, despite other authors demonstrating the opposite (CARMO; BAPTISTA, 2003; CARRARA, 2005; LUNA, 2000; TEIXEIRA, 2006; TODOROV; MOREIRA, 2008). According to Henklain and Carmo (2013), there is a demand for the identification of practices that facilitate teaching, necessitating the study of behavior through experimental analysis that "allows the proposal and application of efficient and effective practices and teachings" (p. 707, our translation).

Observing and topographically describing behaviors enables the selection of the primary target responses for intervention and the choice of emergency intervention strategies, aiming to maintain the safety of those involved in the case of aggression and self-injury, focused on weakening or eliminating aggressive responses in the medium or long term (REY, 2018). Functionally understanding the responses emitted by clients is one of the premises of the training in which they are involved.

Observing and topographically describing both the behavior of clients' and professionals' behavior would be a more objective measure of participant learning. The present study aimed to describe and compare the frequency of appropriate and inappropriate behaviors in children exhibiting atypical behaviors during individual sessions. Additionally, it sought to assess the repertoire of appropriate and inappropriate behaviors exhibited by healthcare and

education professionals in managing these behaviors before and after participating in a behavior analysis-based training program.

The research design employed was quasi-experimental, with participants serving as their controls in pre- and post-intervention comparisons within an ABC design: A representing Baseline 1 (identification of atypical behaviors in children and recording of professional and client behaviors during sessions), B denoting the intervention (training course), and C signifying Baseline 2 (identification of atypical behaviors in children and recording of professional and client behaviors during sessions).

For this study, 18 participants, healthcare and education professionals with experience in special education and related demands, were contacted to participate in the research. The *Aberrant Behavior Checklist (ABC)*, developed by Aman *et al.* (1985), was employed. The ABC is an empirically developed scale designed to measure psychiatric and behavioral symptoms, categorized into five major domains (irritability, agitation and crying, lethargy, social withdrawal, and stereotyped behavior). In addition to this instrument, the instructional material "*Serious Behavior Problems in Health Care: How to Deal With Them?*" (Yazawa; Fornazari; Rodrigues, 2018). was utilized. This material consists of three modules, totaling 70 pages of texts and essays, and multiple-choice exercises for assessing the material read, with a self-correction mechanism.

The data collection, conducted in four stages, involved contacting the participants (teachers and healthcare professionals) who were filmed during sessions or in classrooms interacting with children with Autism Spectrum Disorder (ASD) or other diagnoses before the intervention with the educational material (Baseline 1). After filming, participants underwent the "*Serious Behavior Problems in Health Care – How to Deal With Them?*" course with the instructional material. After completing the course, another session of professional interactions or classroom periods was scheduled for filming and data collection for the post-test (Baseline 2).

To analyze pre and post-test filming results, both professional (appropriate and inappropriate) and client behaviors (appropriate and inappropriate) were coded and quantified. The data were subjected to relative frequency analysis at two-time points - before and after the intervention. Additionally, a comparative statistical analysis was conducted using the non-parametric Wilcoxon test.

The intervention, comprising the pre-test filming, the course, and the post-test, lasted approximately five months, with three months exclusively dedicated to completing the course.

Results

The first set of data addresses the results of the pre-test and post-test concerning the categories of appropriate behaviors exhibited by professionals. Table 1 displays the percentage occurrence of appropriate and inappropriate behaviors by professionals. When considering the total values obtained in the pre-test and post-test, it is observed that 75.5% of behaviors exhibited by professionals were deemed appropriate in the pre-test, while in the post-test, this number increased to 95%.

Table 1 - Total appropriate behaviors of professionals in pre-test and post-test in absolute and relative frequency

Behaviors	Pre-test		Post-test	
	n	%	n	%
Appropriate	1828	75,5%	2512	95%
Inappropriate	591	24,5%	131	5%
Total	2419	100%	2643	100%

Source: Compiled by the authors

Table 2 presents the mean values of appropriate and inappropriate behaviors of professionals in the pre and post-test. The statistical analysis showed a significant difference in appropriate and inappropriate behaviors ($p=0.010$ and $p=0.001$).

Table 2 - Comparison of means of total appropriate and inappropriate behaviors of professionals in pre-test and post-test (Wilcoxon Test)

Behaviors	Pre-test		Post-test		p
	Mean	DP	Mean	DP	
Appropriate	101,56	41,88	139,56	49,17	0,010
Inappropriate	32,83	55,19	7,28	13,14	0,001

Source: Compiled by the authors

Considering the total values obtained in the pre-test and post-test for each behavior, an increase from 1828 to 2512 total behaviors is evident. The behavior of *Praising another behavior* saw an absolute frequency increase from 34 to 184; similarly, *Praising complete activity* increased from 112 to 252, and *Talking* increased from 1175 to 1560 (Table 3).

Table 3 - Appropriate behaviors of professionals in pre-test and post-test in absolute and relative frequency

Appropriate Behaviors	Pre-test		Post-test	
Containing the client in aggression	21	1,15%	4	0,16%
Developing playful activities	193	10,55%	234	9,31%
Developing specific activities	292	15,97%	278	11,07%
Talking	1175	64,28%	1560	62,11%
Praising complete activity	112	6,13%	252	10,03%
Praising the emission of another behavior	34	1,86%	184	7,32%
Praising incompatible behavior	1	0,06%	0	0,00%
Total	1828	100,00%	2512	100,00%

Source: Compiled by the authors

Table 4 shows the means of appropriate behaviors before and after the intervention. It is observed that four out of the seven behaviors had higher means in the post-test. The statistical analysis showed that the *Praising complete activity* behavior class significantly changed from pre to post-test ($p=0.031$).

Table 4 - Pre and post-comparison of professionals by classes of appropriate behaviors

Behaviors	Pre-test		Post-test		Z	p
	Mean	DP	Mean	DP		
Containing the client in aggression	1,17	3,31	0,22	0,64	- 1,62	0,1
Developing playful activities	10,72	8,51	13	12,54	- 0,76	0,44
Developing specific activities	16,22	18,69	15,44	11,3	- 0,04	0,96
Talking	65,28	39,15	86,67	38,58	- 1,72	0,08
Praising complete activity	6,22	8,427	14	13,31	- 2,15	0,031
Praising the emission of another behavior	1,89	2,96	10,22	20,87	- 1,82	0,06
Praising incompatible behavior	0,06	0,23	0	0	-1	0,31

Source: Compiled by the authors

Regarding inappropriate behaviors, almost all decreased in frequency, except for *Interrupting service*, which remained at the same values in the pre and post-test. These data are described in Table 5.

Table 5 - Inappropriate behaviors of professionals in pre-test and post-test in absolute and relative frequency

Inappropriate Behaviors	Pre-test		Post-test	
	Absolute	Relative	Absolute	Relative
Ignoring the client in aggression	88	14,89%	19	14,50%
Reinforcing inappropriate behavior	210	35,53%	31	23,66%
Interrupting end activities	108	18,27%	28	21,37%
Not praising DRO	117	19,79%	45	34,35%
Interrupting the service	8	1,35%	8	6,10%
Total	591	100%	131	100%

Source: Compiled by the authors

The investigation also examined changes in pre- and post-intervention averages. Of the five observed behaviors, four had lower averages in the post-test than in the pre-test. The data indicated that three of them decreased significantly: *Reinforcing inappropriate behavior* ($p=0.001$), *Interrupting end activities of their specialty* ($p=0.002$), and *Not praising the emission of DRO* ($p=0.013$), as can be seen in Table 6.

Table 6 - Pre and post-comparison of professionals by classes of inappropriate behaviors

Behaviors	Pre-test		Post-test		Z	p
	Mean	DP	Mean	DP		
Ignoring aggression	4,89	13,17	1,06	2,64	-	0,17
Reinforcing inappropriate behavior	11,67	21,96	1,72	2,63	-	0,001
Interrupting end activities	6,00	9,24	1,56	3,14	-	0,002
Not praising the emission of another behavior	9,83	14,00	2,50	4,89	-	0,013
Interrupting the service	0,44	0,78	0,44	1,65	-	0,33

Source: Compiled by the authors

The clients' behaviors were also analyzed, considering the total of appropriate and inappropriate behaviors in the pre and post-test, and then the specific behaviors analyzed for each class. It is observed that appropriate behaviors increased from 69% to 84.7%, while inappropriate behaviors decreased from 30.8% to 15.3%.

Table 7 - Total appropriate behaviors of professionals in pre-test and post-test in absolute and relative frequency

Behaviors	Pre-test		Post-test	
	n	%	n	%
Appropriate	997	69,2%	1073	84,7%
Inappropriate	443	30,8%	193	15,3%
Total	1440	100%	1266	100%

Source: Compiled by the authors

Table 8 presents the mean values of appropriate and inappropriate behaviors of professionals in the pre and post-test. The statistical analysis showed that inappropriate behaviors ($p=0.024$) significantly decreased from pre- to post-test.

Table 8 - Comparison of means of total appropriate behaviors of clients in the pre-test and post-test (Wilcoxon Test)

Behaviors	Pre-test		Post-test		p
	Mean	DP	Mean	DP	
Appropriate	55,39	41,77	59,61	40,76	0,76
Inappropriate	24,61	33,93	10,72	19,00	0,024

Source: Compiled by the authors

Regarding specific appropriate behaviors of clients, presented in Table 9, an increase in the category *Adhering to the activity* and the total of emitted behaviors can be identified.

Table 9 - Appropriate behaviors of clients in pre-test and post-test in absolute and relative frequency

Appropriate Behaviors	Pre-test		Post-test	
Adhering to the activity	174	17,45%	365	34,01%
Communicating appropriately	512	51,35%	487	45,38%
Following guidance	311	31,19%	221	20,59%
Total	997	100,00%	1073	100,00%

Source: Compiled by the authors

The means of appropriate behaviors at both moments were also compared. Only the behavior class *Adhering to the activity* had a statistically significant difference ($p=0.003$), increasing from pre to post-test, as observed in Table 10.

Table 10 - Pre and post-comparison of clients by classes of appropriate behaviors

Behaviors	Pre-test		Post-test		Z	p
	Mean	DP	Mean	DP		
Adhering to the activity	9,67	5,85	29,28	12,37	-	0,003
Communicating appropriately	28,44	28,60	27,06	38,76	-	0,70
Following guidance	17,28	15,79	12,28	10,08	-	0,23

Source: Compiled by the authors

Inadequate behaviors can be viewed in Table 11. Only the category *Masturbating* did not decrease from pre- to post-test, while the other categories decreased in their frequencies.

Table 11 - Inadequate behaviors of clients in pre-test and post-test in absolute and relative frequency

Inadequate Behaviors	Pre-test		Post-test	
Self-aggression	13	2,93%	2	1,03%
Other-aggression	17	3,83%	0	0%
Masturbating	0	0%	31	16,06%
Defecating	1	0,22%	0	0%
Environment Destruction	67	15,12%	26	13,47%
Screaming	100	22,57%	47	24,35%
Stereotypy	239	53,95%	87	45,07%

Allotriophagia	3	0,67%	0	0
Crying	3	0,67%	0	0
Total	443	100,00%	193	100,00%

Source: Compiled by the authors

Significant changes in the means of inappropriate behaviors were also investigated. Of the observed behaviors, eight had lower standards in the post-test, but only one of the wrong behavior classes, *Stereotypy* ($p=0.007$), had a significant difference between the two assessment moments, as seen in Table 12.

Table 12 - Pre and post-comparison of clients by classes of inappropriate behaviors (Wilcoxon Test)

Behaviors	Pre-test		Post-test		Z	p
	Mean	DP	Mean	DP		
Self-aggression	0,72	2,6	0,11	0,32	-0,73	0,46
Other-aggression	0,94	2,46	0	0	-1,84	0,06
Masturbating	0	0	1,72	7,3	-1	0,31
Defecating	0,06	0,23	0	0	-1	0,31
Environment Destruction	3,72	9,15	1,44	5,17	-1,95	0,051
Screaming	5,56	13,12	2,61	7,6	-1,48	0,13
Stereotypy	13,28	23,25	4,83	10,46	-2,68	0,007
Allotriophagia	0,17	0,51	0	0	-1,34	0,18
Crying	0,17	0,38	0	0	-1,73	0,08

Source: Compiled by the authors

Discussion

The obtained data point to significant changes after the intervention. Regarding professionals' appropriate and inappropriate behaviors in the pre and post-test, both showed significant solid differences, indicating an increase in proper behaviors and a considerable decrease in problematic behaviors in the post-test, confirming the hypotheses raised.

The data related to the appropriate behaviors of professionals in the first filming provide an overall view of the participants' initial behaviors, such as "*Talking*" being the most frequently observed behavior, followed by *Developing specific activity* and *Developing playful activity*. These behaviors are kept in the initial repertoire of these participants as they are part of the

working repertoire of these professionals. After becoming familiar with the concepts of AC, Functional Analysis (FA), and DRA and DRI through the training program, an increase in categories of behaviors such as praising complete activity, praising the emission of another behavior, and praising incompatible behavior was expected.

The behavior *Praising complete activity* class showed statistical significance, which can be inferred as an attempt to reinforce appropriate behaviors of clients/students. Among these, only *Praising incompatible behavior* did not increase, which may signal that the participants understood the need to sequence the appropriate behaviors their clients emitted appropriately. According to Cowdery, Iwata and Pace (1990), differential reinforcement has good results in self-aggression. Another expected result is that by reinforcing other, more appropriate behaviors, inappropriate ones decrease in frequency, thus expanding the behavioral repertoire.

The inappropriate behaviors also showed expected results after participants came into contact with the material, decreasing in frequency, with only *Interrupting the session* maintaining the same score. Regarding the inappropriate behaviors of professionals, the classes that significantly decreased in the post-test were: reinforcing inappropriate behavior, interrupting end-of-session activities in their specialty, and not praising the emission of DRO. These data suggest that, after becoming aware of AC concepts, professionals paid attention to the consequences issued by these behaviors of their clients, with a decrease in reinforcing inappropriate behaviors, interrupting ongoing activities, and not praising other appropriate behaviors that might arise during the session. As for the categories of behaviors that showed a statistically significant difference, it is observed that stereotypy demonstrated a robust considerable difference. This difference suggests a reduction in behaviors associated with this class from the pre-test to the post-test.

Related to the appropriate behaviors of the children, adhering to the activity and *the total* behaviors showed an increase. Total appropriate behaviors increased in frequency, and the children started to stick more to the actions proposed by the professionals. This same data showed a vital statistically significant difference in the analysis. As pointed out by Boutot and Tincani (2009), by providing conditions for children to manifest more appropriate behaviors, the frequency of these behaviors is observed through the implementation of differential reinforcements.

Inappropriate behaviors of the children decreased in almost all categories except for *Masturbating*. It is inferred that an unidentified variable, environmental or medicinal, altered the child's behavior regarding this behavioral class. A moderate significant decrease could be

observed in the children's inappropriate behaviors, suggesting a reduction in inappropriate behaviors from pre-test to post-test. The data obtained from the clients show that improvements in the professionals' educational practices are quickly reflected in their clients' conduct, enabling better learning conditions in therapeutic or pedagogical sessions.

Some behaviors, such as *praising a complete activity*, *praising the emission of another behavior*, are behaviors in which the emitter must be attentive to be contingent. Emitting such behaviors appropriately requires learning some skills, such as conducting a Functional Analysis, and thus, making the correct discrimination of the client's behaviors and behaving appropriately.

Final considerations

The present study aimed to describe and compare the appropriate and inappropriate behaviors exhibited by professionals and children with atypical behaviors after the implementation of the training program. The results indicated a significant increase in appropriate behaviors and a significant decrease in inappropriate behaviors for professionals and the involved children. Professionals showed greater attention in providing reinforcing consequences for their clients' behaviors, demonstrating an increase in praise and greater adherence to activities by the children.

Professionals also reinforced fewer inappropriate behaviors and interrupted the end activities that were being developed with the children. Participants' patient-clients adhered more to the proposed activities in the post-test, which may be a consequence of the behavior of *Praising a complete training*, which was also emitted more frequently in the post-test. Participants became more attentive to the behaviors they radiated in response to the children's conduct, which may have resulted in the observed numbers in the post-test. The category *Masturbating* remained at the same frequency, most likely due to the sensory reinforcing consequences of this behavior. Professionals probably learned to assess the behaviors they emitted as a consequence of children's behaviors, even if they could not precisely name the procedures (DRA, DRI, or DRO) – thus, patient-clients increased appropriate behaviors (*Adhering to the activity* and *Communicating appropriately*).

As a limitation of this study, more participants could provide more generalizable data for professional practices. Another limitation is that the teaching program was universal not directly associated with their specific needs. It was not possible to predict and control

extraneous variables that may have influenced some behaviors, such as masturbation in the post-test, which was emitted by a single participant.

For future studies, it is suggested to conduct follow-ups to assess any changes in the results. Additionally, it is recommended to incorporate in-person meetings during the intervention, allowing for video feedback. This approach enables participants to observe their behavior and that of their clients in appropriate and inappropriate situations. It facilitates collaborative reflection with the researcher on implementing differential reinforcement strategies in cases where inappropriate behavior occurs for both the professional and the client.

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