

# Effects of teaching of verbal behavior to people with autism spectrum disorder: a systematic review

## Efeitos do ensino do comportamento verbal para pessoas com transtorno do espectro autista: uma revisão sistemática

## Efectos de enseñar conducta verbal a personas con trastorno del espectro autista: una revisión sistemática

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### Abstract

**Introduction:** One of the central symptom domains of Autistic Spectrum Disorder (ASD) is the communication deficit, which can present itself in different ways. **Objective:** Analyze the effects of teaching verbal behavior in people with ASD. **Method:** Systematic literature review by searching the Scielo, Lilacs and Pubmed databases, using the following descriptors: “autism spectrum disorder”; “Verbal behavior” and “teaching”, as well as their descriptors in the English language. Studies published between 2014 and 2019 were selected, with data that met the theme established in Portuguese, Spanish and English. **Results:** The search resulted in seven articles. The most frequent verbal operant was the mand, followed by the intraverbal and the echoic. The teaching of verbal behavior had positive effects. On mand, caused

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### Authors' contributions

EMSB, MFLSL, NCSO: Wrote the first version of the review and reviewed the articles and finished the manuscript..

MAMB: Supervised the search for articles and contributed to the writing and conclusion of the manuscript.

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**Received:** 11/30/2020

**Accepted:** 02/06/2021

the reduction of the occurrence of problem behaviors and helping in a successful social interaction and contributing to an immediate and social control over the environment. The echoic was pointed out as the verbal operant that plays a fundamental role in the teaching of other verbal behaviors. The intraverbal is important for the development of social and academic skills. The limitation of the results consists in not presenting studies referring to all verbal operants, considering only three and the interval of year of publication analyzed. **Conclusion:** The teaching of verbal operants is important for a better performance and development of functional communication of people with autism, also reflecting on social, academic and playing aspects, in addition to the contribution to reducing the chances of disruptive behaviors.

**Keywords:** Autistic Spectrum Disorder; Verbal behavior; Benefit;

## Resumo

**Introdução:** Um dos domínios de sintomas centrais do Transtorno do Espectro Autista (TEA) é o déficit de comunicação, que pode se apresentar de diversas formas. **Objetivo:** Analisar os efeitos do ensino do comportamento verbal em pessoas com TEA. **Método:** Revisão sistemática da literatura por meio de buscas nas bases de dados Scielo, Lilacs e Pubmed, utilizando os seguintes descritores: “*transtorno do espectro autista*”; “*comportamento verbal*” e “*ensino*”, bem como seus descritores na língua inglesa. Foram selecionados estudos publicados entre 2014 e 2019, com dados que atendiam à temática estabelecida em português, espanhol e inglês. **Resultados:** A pesquisa resultou em sete artigos. O operante verbal mais frequente foi o mando, seguido pelo intraverbal e o ecóico. O ensino de comportamento verbal apresentou efeitos positivos. No mando, ocasionou a redução da ocorrência de comportamentos-problema, auxiliando em uma interação social bem-sucedida e contribuindo para um controle social e imediato sobre o ambiente. O ecoico foi apontado como o operante verbal que desempenha papel fundamental no ensino de outros comportamentos verbais. O intraverbal é importante para o desenvolvimento de habilidades sociais e acadêmicas. A limitação dos resultados consiste em não apresentar estudos referentes a todos os operantes verbais, contemplando apenas três, assim como o intervalo de ano de publicação analisado. **Conclusão:** O ensino dos operantes verbais é importante para um melhor desempenho e desenvolvimento da comunicação funcional de pessoas com autismo, refletindo também em aspectos sociais, acadêmicos e no brincar, além da contribuição para a redução das chances de ocorrência de comportamentos disruptivos.

**Palavras-chave:** Transtorno do Espectro Autista; Comportamento verbal; Benefício.

## Resumen

**Introducción:** Uno de los dominios de síntomas centrales del trastorno del espectro autista (TEA) es el déficit de comunicación, que puede presentarse de diferentes formas. **Objetivo:** Analizar los efectos de la enseñanza de la conducta verbal en personas con TEA. **Método:** Revisión sistemática de la literatura mediante búsquedas en las bases de datos Scielo, Lilacs y Pubmed, utilizando los siguientes descriptores: “*trastorno del espectro autista*”; “*Conducta verbal*” y “*enseñanza*”, así como sus descriptores en el idioma inglés. Se seleccionaron estudios publicados entre 2014 y 2019, con datos que cumplieran con la temática establecida en portugués, español e inglés. **Resultados:** La búsqueda resultó en siete artículos. La operante verbal más frecuente fue el mand, seguida de la intraverbal y la ecoica. La enseñanza de la conducta verbal mostró efectos positivos. En el mand, provocó la reducción de la ocurrencia de conductas problemáticas y ayudó a una interacción social exitosa y contribuyó a un control social e inmediato sobre el medio ambiente. La ecoica fue señalada como la operante verbal que juega un papel fundamental en la enseñanza de otras conductas verbales. El intraverbal es importante para el desarrollo de habilidades sociales y académicas. La limitación de los resultados consiste en no presentar estudios referentes a todos los operantes verbales, considerando solo tres y el intervalo de año de publicación analizado. **Conclusión:** La enseñanza de operantes verbales es importante para un mejor desempeño y desarrollo de la comunicación funcional de las personas con autismo, reflexionando también sobre aspectos sociales, académicos y lúdicos, además de contribuir a reducir las posibilidades de conductas disruptivas.

**Palabras clave:** Trastorno del Espectro Autista; Conducta Verbal; Beneficio.

## Introduction

According to the DSM-5, Autism Spectrum Disorder (ASD) is characterized by two domains of core symptoms, which are: deficits in social interaction and communication, as well as restricted and repetitive behaviors, interests and activities<sup>1</sup>.

According to data from the Centers for Disease Control and Prevention (CDC), there is an estimate that 1 in every 54 children is diagnosed with ASD in the United States<sup>2</sup>. Concerning the estimation of cases of ASD in Brazil, the severe shortage of studies in the area is notorious, as well as the lack of data to estimate its current incidence<sup>3</sup>.

As for the characteristics, the person with ASD may present impairments in social-emotional reciprocity, that is, difficulty in sharing and recognizing feelings and thoughts, in addition to deficits in the skills to initiate and maintain social interactions, a fact that may be related to a lack of interest in the other, or even inappropriate ways to initiate interactions. These inappropriate attempts to make contact are also related to communication responses, both verbal and non-verbal<sup>4</sup>.

Without a doubt, communication is an extremely important tool for building and strengthening social relationships. Considering that it is through it that it is possible to understand people, objects, events, and relate to everything<sup>5</sup>.

Communication is a complex mechanism, which contributes to the strengthening of social relationships, as mentioned above, but it also depends on these social relationships for its development. Accordingly, for children with ASD, communication is a challenge<sup>5</sup>.

Although the impairments related to communication deficits vary widely among people, it is possible to affirm that these impairments are related to semantics and pragmatics<sup>5</sup>. Difficulties in making requests, expressing needs, naming and describing objects, asking and answering questions, as well as sustaining dialogues, are common. These facts can trigger, for example, problem behaviors (crying, screaming, throwing oneself on the floor, self-harm, hetero-aggression, among others), thus influencing the integration of the individual in his/her social and academic environment<sup>6</sup>.

For Applied Behavior Analysis, language is considered an operant behavior, and Skinner, in his works, referred to the types of communicative behavior as verbal behavior<sup>6</sup>.

In communication, there are different behaviors that are produced in different contexts, which were called verbal operants. Verbal operants are classified based on their antecedents and consequences: mand, echoic, tact, intraverbal, textual and transcription<sup>7</sup>.

The mand is defined as a verbal response used to ask for items, information, give instructions, orders and advice; the echoic consists of the repetition of words spoken by the other; the tact is the naming of items; the intraverbal is the operant responsible for providing responses and making comments; the text consists of reading written words; and, finally, the transcription is the writing of words said by the other<sup>6</sup>.

Communication has been the object of many studies on the development of people with ASD. The deficit present in this area is associated with difficulties in other segments of the subject's life. Thus, learning a functional communication will affect, among other aspects, understanding, responses to stimuli in general, whether verbal or non-verbal, and social relationship, the latter being important for the emergence of other types of learning<sup>8</sup>.

The relevance of this research is justified, since communication is one of the bases of impairment of ASD and is related to different areas of the subject's life; that is why it is extremely important to understand the impacts of teaching functional communication, under the bias of the Behavior Analysis.

Given what has been described above, this study aims to analyze the effects of teaching verbal behavior in people with ASD.

## Method

A systematic review was carried out following the recommendations of the PRISMA statement<sup>9</sup>. Manuscripts were searched in the SciELO, LILACS and PubMed databases, using the following descriptors: "*transtorno do espectro autista*" AND "*comportamento verbal*" AND "*ensino*", as well as its descriptors in the English language: "*autism spectrum disorder*" AND "*verbal behavior*" AND "*teaching*".

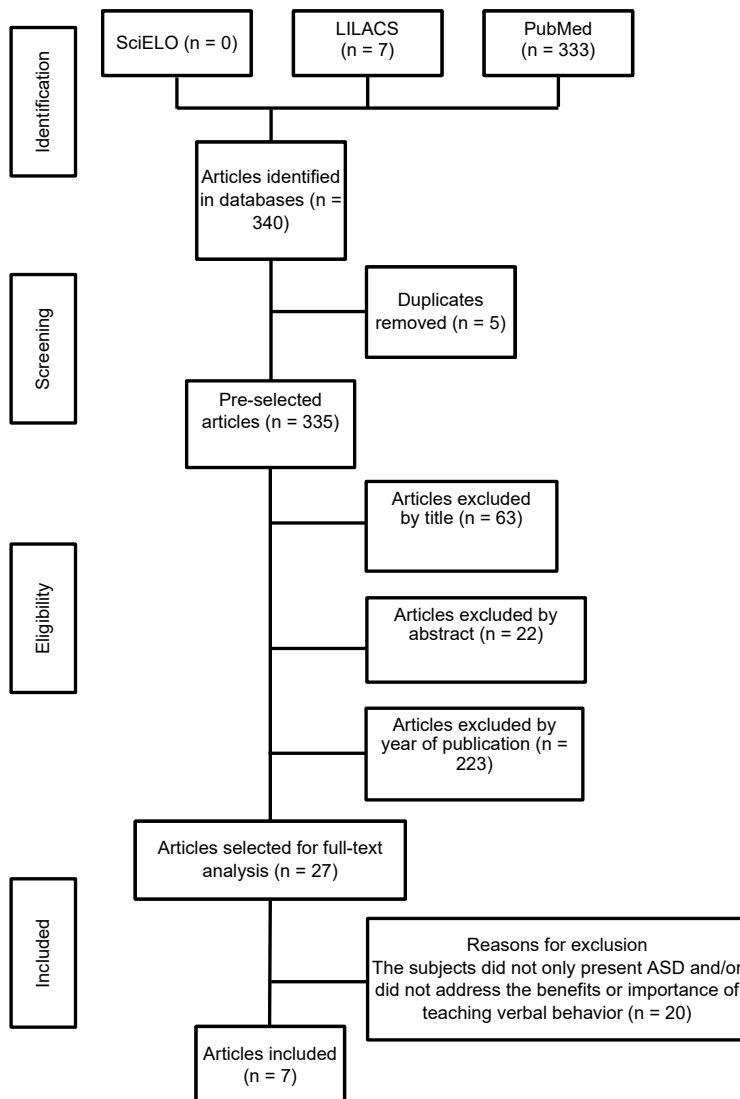
Steps taken: elaboration of the guiding question, literature search, data collection, critical analysis of the included studies, discussion of results and presentation of the integrative review. The analysis of the extracted data was conducted

descriptively in two steps. Initially, the article location data, year, authorship, objective, methodology, main results and conclusion were identified. Subsequently, there was a critical analysis of the articles and a discussion of the main findings of the studies.

The following items were considered as selection criteria for the studies: (a) having been published between 2014 and 2019; (b) having data that met the theme established by the descriptors;

and (c) being published in Portuguese, Spanish, and English.

As for the exclusion criteria, there are: (a) studies published in years prior to 2014; (b) the research subjects have comorbidities associated with ASD; and (c) the study does not address the benefits or importance in teaching verbal behavior in people with ASD. Figure 1 presents a flowchart illustrating the search process.



**Figure 1.** Flowchart following recommendations of PRISMA initiative. Excerpted from Moher et al<sup>8</sup>.

## Results

A total of seven articles were identified. These manuscripts are presented in Table 1, where it is possible to see how many subjects took part in each study, data on age and gender, place where the research was developed, study design, verbal operant that was taught and the effects coming from the teaching.

### Characteristics of the selected studies

The articles selected to compose this systematic review are longitudinal studies. The studies had 25 participants, three of which involved female subjects<sup>10-12</sup> and the others had exclusively male participants<sup>13-16</sup>. With regard to age, this ranged from 3.50<sup>10</sup> to 32.50 years<sup>16</sup>.

Concerning the place where the study was carried out, there was a predominance of the school environment<sup>10-13</sup> and only one of the researches

was carried out in Brazil<sup>11</sup>, while the others were carried out in the United States of America<sup>10,11,13-16</sup>.

### Verbal Operants

The most frequent verbal operant in the researches was the mand<sup>10,13,12,16</sup>, followed by the intraverbal<sup>13,12</sup> and, finally, the echoic<sup>11</sup>.

### Effects of the teaching of verbal behavior

Among the effects related to teaching about the mand, there is a reduction in the occurrence of problem behaviors<sup>10,16</sup>. In addition, the mand was appointed as an operant that helps in successful social interaction<sup>15</sup>, a fact that contributes to social and immediate control over the environment<sup>12</sup>.

The echoic was appointed as the verbal operant that plays a fundamental role in teaching other verbal behaviors<sup>11</sup>. The intraverbal operant was pointed out as important for the development of social and academic skills<sup>13,14</sup>.

**Table 1.** Characteristics of eight of the studies selected for the systematic review

Reference	N	Sex (%)	Age ( $\bar{X}$ )	Setting	Design	Verbal Operant	Benefits
Chezan et al. (2016)	2	M (50)	3.50	School – United States	Longitudinal study	Mand	Reduced chances of the emergence of problem behaviors
Najdowski et al. (2017)	3	M (100)	10.33	Residence and leisure park – United States	Longitudinal study	Mand	It helps to promote successful social interaction
Kunnavatana, Wolfe and Aguilar (2018)	2	M (100)	32.50	School – United States	Longitudinal study	Mand	Reduced problem behavior and increased independent communication
Jesus, Oliveira and Rezende (2017)	4	M (50)	8.25	School and residence – Brazil	Longitudinal study	Mand	Greater and immediate social control over the environment
Cividini-Motta, Scharre and Ahearn (2016)	6	M (83.3)	12.66	School, residence or research room – United States	Longitudinal study	Echoic	Teaching of other verbal behaviors
Allan et al. (2014)	4	M (100)	12	School – United States	Estudo longitudinal	Intraverbal	Development of academic and social skills
Peters and Thompson (2015)	4	M (100)	6.75	Medical clinic – United States	Longitudinal study	Intraverbal	Development of social skills

Source: Authors.  $\bar{X}$ : mean.

## Discussion

The selected studies showed a predominance of men, a characteristic that has already been identified in other researches. The literature points out that, since the 1970s, ASD has been considered a disorder that mainly affects male individuals<sup>17</sup>.

A Brazilian research involving 243 children and adolescents with ASD found that, in its study population, there was 4.16 times more probability that the individual with ASD was male<sup>18</sup>. In addition, a systematic review published in 2019, which aimed to investigate Brazilian articles on interventions in individuals with ASD, also pointed out that there was a predominance of male individuals in the four articles selected for analysis<sup>19</sup>.

Of the seven researches reported here, one was carried out in Brazil<sup>12</sup>, while the others were carried out in the United States<sup>10,11,13-16</sup>. This is a frequent reality for those who study about ASD and behavior analysis, as the United States is the cradle of behavior analysis. A study<sup>20</sup> points out that Brazil is, currently, the largest center for behavior analysis, after the United States.

It was also found that the researches found correspond, without exception, to longitudinal studies. This data may be related to the fact that this type of design allows the monitoring of the same group of subjects for a certain period of time, a characteristic of paramount importance when it comes to teaching a certain skill. On the other hand, the number of subjects tends to be smaller than in cross-sectional studies, because, among other aspects, there may be a loss of subjects throughout the research due to several factors<sup>21</sup>, characteristics observed in the number of participants in each study, where the research with more participants involved has an  $N = 611$ .

The importance given to the teaching of verbal behavior may be related to the fact that communication is associated with the child's cognitive, emotional and social development, and may also be related to the emergence of disruptive behaviors. Accordingly, a loss in the area of communication can affect all the areas mentioned above<sup>22,23</sup>. Thus, when developing skills related to verbal behavior, the subject can show a significant improvement in his/her quality of life, resulting in better functioning and development in the environment in which he/she is inserted<sup>24</sup>.

Most of the articles selected in this study address the teaching of the mand for people with ASD. A literature review<sup>25</sup> corroborates, in part, with this finding; the authors identified that, of the 45 articles reviewed, the tact and the mand operants corresponded to 80% of the articles. There is no data on the other verbal operants, as these were not objects of study in the research.

This can be justified by considering that it is common for the mand to be the first operant to develop in children and, consequently, it is of paramount importance for the initiation of the learning of verbal behavior<sup>6,26,27</sup>.

The studies presented here pointed out that the teaching of the mand reduced the chance of the emergence of behavior problems and increased the probability of successful social interaction. Such findings are corroborated by some researches, which emphasize that the teaching of mands should be one of the main intervention focuses, since it reduces the chance of the occurrence of inappropriate behaviors and gives the child control over the social environment, both in the scope of initiating verbalizations or for attention and shared play<sup>6,26,28</sup>.

In two Brazilian studies, the subjects were submitted to the teaching of the mand verbal operant through an alternative/augmentative communication system (Picture Exchange Communication System – PECS). In both studies, the subjects showed a reduction in problem behaviors, and the authors added that there was an increase in vocalizations with communicative intent or even functional speech, as well as longer visual contact and social smile<sup>12,27</sup>.

The echoic was appointed as the verbal operant that plays a fundamental role in teaching other verbal behaviors<sup>11</sup>, as other authors<sup>6</sup> state that, in most cases, the echoic is the first operant to be taught, especially to children with little or no vocalization. In addition, it was pointed out in a literature review<sup>25</sup> that the echoic was a prerequisite in 70% of studies related to the teaching of mand and tact.

A systematic review<sup>29</sup> pointed out that the teaching of the echoic is little investigated in the literature, despite its importance being recognized for the teaching of other operants. Accordingly, the authors stated that there is a deficit of studies that establish the echoic as the main objective of teaching in people with ASD, adding that most studies place the echoic as a tip for the establishment of another verbal operant.

As already described in the cited works, the intraverbal operant is closely related to the development of social skills and academic skills. The same finding can be observed in a literature review<sup>28</sup> in which the authors state that the intraverbal operant plays an important role in social interactions, whether for conversations, music and story description, and that part of this is the product of teaching in the area of academic skills.

The intraverbal operant allows the subject to provide responses in conditions of interaction, from conversations to academic situations. Nevertheless, when the intraverbal repertoire is varied, it is possible to provide faster and more accurate responses. Therefore, a deficit in this operant can generate difficulties in social interactions (due to losses in conversations) and in academic activities (due to difficulties in answering questions, reciting poems, singing songs, among others)<sup>30</sup>.

The present systematic literature review is limited in its results because it does not present studies referring to all verbal operants, covering only three, as well as due to the delimited time period, which comprises studies from 2014 to 2019, and due to the fact of having been carried out in three databases.

## Conclusion

This systematic review demonstrates that verbal operants are important for a better performance and development of functional communication in people with autism, also reflecting on social, academic and ludic aspects. In addition, it contributes to reducing the chances of the occurrence of disruptive behaviors.

Moreover, it was noted that there is more in-depth research on the mand verbal operant, which requires more studies addressing the other operants, because, among the inclusion criteria used in the study, no articles were found that referred to the tact, textual and transition operants.

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