

# Modes of linguistic interaction between mother-child dyad with autism spectrum disorder (ASD) AAC user

Modos de interação linguística  
da díade mãe-criança com Transtorno do  
Espectro Autista (TEA) usuária de CSA

Modos de interacción lingüística  
de la díada madre-hijo con Trastorno  
del Espectro Autista (TEA) usuaria de CAA

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## Abstract

**Introduction:** The main characteristics of Autism Spectrum Disorder (ASD) are deficits in communication, social interaction, patterns of behaviors and restrictive and repetitive activities and interests. Children with ASD, restricted orality, can benefit from Augmentative and Alternative Communication (AAC) to promote language, with mothers being the main communication partners. It is interesting to study the aspects that favor or not the language of these children. **Objective:** Analyze the enunciative modes of mothers-children's dyads with ASD, restricted orality and AAC users. **Material and Method:** Clinical, descriptive and cross-sectional study approved by the Research Ethics Committee (REC) under no. 47884421.10000.540, three mothers and their children with ASD, restricted orality and AAC users. Two videos of free interaction of the mother/child dyad were requested and transcribed by Elan software and statistical analysis. Analysis categories were established. **Results:** There is a statistically significant difference between the dyads' enunciative modes regarding the number of occurrences for mothers and children. The most frequent enunciative modes for mothers were "*being flexible*", changing and/or adapting the form and content addressed to children, and "*presuming competence*", through the attribution of meaning, using speech, which generated higher frequencies of responses from children. **Conclusion:** The

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Authors' contributions:

TC: study conception, methodology, data collection, article design.

RYSC: article conception, critical revision and study orientation.

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enunciative modes most used by the mothers studied also corresponded to the modes that promoted more responses from the children, favoring language, an important support for therapeutic care. The findings bring the mothers closer to what is expected for good communication partners, which corroborates the hypothesis that speech therapy monitoring contributed to raising awareness among the mothers.

**Keywords:** Autism Spectrum Disorder; Mother-Child Relationships; Child Language; Nonverbal Communication; Speech-Language Pathology.

## Resumo

**Introdução:** As principais características do Transtorno do Espectro Autista (TEA) constituem déficits na comunicação, interação social, padrões de comportamentos, atividades e interesses restritivos e repetitivos. Crianças com TEA, oralidade restrita, podem se beneficiar da Comunicação Suplementar e Alternativa (CSA) para favorecer a linguagem, sendo as mães, principais parceiras de comunicação. Interessa estudar, os aspectos que favorecem ou não a linguagem destas crianças. **Objetivo:** Analisar os modos enunciativos das díades mães-crianças com TEA, oralidade restrita e usuárias de CSA. **Material e Método:** Clínico, descritivo e transversal aprovado pelo Comitê de Ética em Pesquisa (CEP) sob n. 47884421.10000.540, três mães e suas crianças com TEA, oralidade restrita e usuárias de CSA. Solicitados dois vídeos de interação livre da díade mãe/criança e transcritos pelo software Elan e à análise estatística. Estabelecidas categorias de análise. **Resultados:** Existe diferença estatisticamente significativa entre os modos enunciativos das díades quanto ao número de ocorrências para as mães e para as crianças. Modos enunciativos de maior frequência das mães foram “*ser flexível*”, mudando *e/ou adaptando a forma e o conteúdo dirigido às crianças* e “*presumir competência*”, através da atribuição de significado, utilizando a fala, as quais geraram maiores frequências de respostas das crianças. **Conclusão:** Modos enunciativos mais utilizados pelas mães estudadas corresponderam também aos modos que promoveram mais respostas das crianças, favorecendo linguagem, importante subsídio para o atendimento terapêutico. Os achados aproximam as mães do esperado para bons parceiros de comunicação, que corrobora a hipótese do acompanhamento fonoaudiológico ter contribuído para conscientizar as mães.

**Palavras-chave:** Transtorno do Espectro Autista; Relações Mãe-Filho; Linguagem Infantil; Comunicação Não-Verbal; Fonoaudiologia.

## Resumen

**Introducción:** principales características del Trastorno del Espectro Autista (TEA) son déficits en la comunicación, interacción social, patrones de conducta, actividades e intereses restrictivos y repetitivos. Niños con TEA y habla restringida pueden beneficiarse de la Comunicación Aumentativa y Alternativa (CAA) para promover el lenguaje, siendo las madres, principales interlocutoras en la comunicación. Interesante estudiar los aspectos que favorecen o no el lenguaje de estos niños. **Objetivo:** Analizar modos enunciativos de las díadas madres-hijos con TEA, habla restringida y usuarios de CAA. **Material y Método:** Clínico, descriptivo y transversal aprobado por el Comité de Ética en Investigación (CEI) bajo el n. 47884421.10000.540, tres madres y sus hijos con TEA, habla restringida y usuarios de CAA. Solicitados dos videos de interacción de la díada madre/hijo y transcritos por el Elan y análisis estadístico. Categorías de análisis establecidas. **Resultados:** existe diferencia estadísticamente significativa entre las formas enunciativas de díadas al número de ocurrencias para las madres y para los hijos. Modos enunciativos más frecuentes de las madres fueron “*ser flexibles*”, cambiando *y/o adaptando la forma y el contenido dirigido a los niños* y “*asumir competencia*”, a través de atribución de significado, utilizando el habla, lo que generó mayores frecuencias de respuestas de los niños. **Conclusión:** modos enunciativos más utilizados por las madres también correspondieron a los modos que promovieron más respuestas de niños, favoreciendo el lenguaje. Los hallazgos acercan a las madres a lo que se espera de buenos interlocutores de comunicación, que corrobora hipótesis que asistencia logopédica ha contribuido a concienciar a las madres.

**Palabras clave:** Trastorno del Espectro Autista; Relaciones Madre-Hijo; Lenguaje Infantil; Comunicación No Verbal; Patología del Habla y Lenguaje.

## Introduction

This study understands acquisition of language under an enunciative approach in which children need the other since birth for the “semantization of language”<sup>1</sup>. As the speaker opens and acknowledges the child’s space for enunciation, both occupy distinct and dynamic (rather than hierarchical) discursive roles in their dialogical relationship. Although at birth, the adult is at first more discursively visible, the baby is active in this process, using their resources to interact with the other<sup>2</sup>.

Children diagnosed with autism spectrum disorder (ASD) are classified by symptoms that characterize the new diagnostic criteria of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders and the American Psychiatric Association<sup>3</sup>: mainly persistent deficits in social communication and interaction; patterns of behavior and interests, restrictive and repetitive activities; and difficulties in language characteristics such as non-verbal and verbal behaviors.

Communication constitutes one of the most affected aspects of ASD. It can increase stress and greatly concern families<sup>4</sup>. Studies on autism and families show a poor paternal participation<sup>4</sup>, generally causing greater maternal burden and raising the importance of studying the modes of interaction of the mother-child dyad.

Children with ASD often have unconventional communicative repertoires, and parents are often the first to notice these characteristics and to worry about their development and future<sup>5</sup>. They have language delays or little speech in a significant proportion. Moreover, it is worth highlighting the variability of difficulties in the language of these children. Most of this population faces the greatest linguistic challenges in pragmatics<sup>6;7;28</sup>.

In view of the communication difficulties of children with ASD, augmentative and alternative communication (AAC) can favor their language and interaction<sup>8</sup>. In this context, authors evince the importance of the interlocutor in favoring language<sup>9</sup>. Individuals influence each other for communication, and when a person uses AAC, the communication partner must effectively participate in it to achieve successful communication<sup>9</sup>.

The basis to begin the development of children encompass their first motor, cognitive, linguistic, affective, and social models and supports<sup>10</sup>. Thus, the mother still constitutes one of the main

interlocutors in child development and the main communication partner in language development.

The international literature on AAC<sup>9;11</sup> brings some characteristics of communication partners for children with complex communication needs. This study considered these characteristics based on the AssistiveWare Portal<sup>12</sup> to analyze the language and interaction of the chosen dyads. Other studies show some interlocutors’ modes of communication interaction that can favor children’s interaction, such as facial expressions, gestures such as pointing, looking at the child, changing body position to draw the child’s attention, taking the child by their hand, holding them in the interlocutor’s arms, and the use of music<sup>13-16</sup>.

An investigation<sup>6</sup> on the parents of children with ASD and the convergence of data on their communicative alterations evinced the role of parents in their children’s communicative process. The study indicates the importance of inserting the family in the therapeutic process and language development, which reaffirms the importance of our study on the modes of communication of autistic children with little vocal expression and their main communication partners: their mothers.

This justifies the interest in evaluating mothers as these children’s main communication partners as they constitute the first nucleus of their children and their main mediators. Although research has focused on ASD and the characteristics of language, few studies have addressed their communicative modes, such as Souza<sup>1</sup>. Further research is necessary, particularly in the Brazilian literature, in order to understand the enunciative modes that favor the language of non-verbalized autistic children who use AAC systems. Thus, this study aimed to analyze the enunciative modes of dyads composed of mothers and children with ASD and restricted speech, who use AAC.

## Material and Method

This clinical, descriptive and cross-sectional study was approved by the Research Ethics Committee under no. 47884421.1.0000.540. This research was explained to its participants, who were asked to sign an informed consent form before inclusion. The sample consisted of three mothers and their children with ASD, restricted speech, and users of AAC. The following inclusion criteria were used: children who were diagnosed with ASD by

a neurologist, psychiatrist, or a multidisciplinary team, aged from five to nine years, showed restricted speech and who use AAC, or received in speech-language pathology follow-up at the time of data collection and their mothers. The following were chosen as exclusion criteria: children who were unable to be recorded on video interacting with their mothers for any reason, mothers with language difficulties that compromised their ability to answer the data collection instrument, or those who had no wish to participate in this research.

Data was collected from mothers and children to describe their sociodemographic profile and characterize their children's language use. Also, two videos with dialogues between the mother and the child in their daily life were requested from the mothers. These videos could consist of previous recordings or be produced specifically for this research, but they had framed the simultaneous presence of the mother and the child in the video. Considering the spontaneous nature of the videos and the fact that some were already recorded, a minimum or maximum duration for the recordings was ignored.

The videos were transcribed on ELAN (see sample transcription in **Appendix A**) to analyze the interactions based on records of the time and duration of the speech of the participating dyads<sup>17</sup>.

The videos had the following durations: Video 1 with dyad 1 (M1 and C1) lasted 37 seconds and Video 2, three minutes and 23 seconds; Video 1 with dyad 2 (M2 and C2) lasted four minutes and 15 seconds and Video 2, 27 seconds; and Video 1 with dyad 3 (M3 and C3) lasted one minute and 28 seconds and video 2, one minute and 22 seconds. These videos showed various play situations chosen by the mothers, such as music activities, preparing meals, and a visit to the beach. ELAN can create spreadsheets with the data selected for each dyad and note the time and duration of the analyzed items, enabling the description and quantification of these aspects.

In total, five categories of analysis were established according to repetition and relevance criteria<sup>18</sup> and the transcripts of the interaction videos — which were based on previous research<sup>9</sup> and the AssistiveWare Portal: “Key values of a good communication partner.”<sup>12</sup> These authors evaluated the characteristics for a good communication partner of children who use AAC.

Analysis categories are shown in Chart 1, which briefly describes them and their corresponding subcategories (which were established based on several readings of the transcripts of the interactions between participants in the videos).

**Chart 1.** Analysis categories and subcategories

| Categories                | Description                                                                                                                                         | Subcategories                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) Being flexible:        | Change the interaction mode due to the child's response                                                                                             | a) change or adapt to the form/content directed to the child                                                                                                                                                                                                                                                                                               |
| 2) Persist in interaction | Strategies to get the child's attention, avoiding giving up on the interaction. Included are the mother's body movements, such as items d, e, and f | a) call by name (speak)<br>b) change the prosody<br>c) look at the child<br>d) change body position to get the child's attention<br>e) take the child by the hand or hold them on your arms<br>f) imitate the child<br>g) ask open-ended questions (speak)<br>h) ask closed-ended questions (speak)<br>i) get the child's attention by removing the object |
| 3) Presume competence:    | Believe in the child's potential to communicate, legitimizing their expressions and validating their participation in the dialogue.                 | a) praise the child (speak)<br>d) attributing meaning to linguistic expressions (looking, pointing, body movement, gestures, AAC, and vocalizations) (speaking)<br>e) encourage AAC use (communicate for various reasons)                                                                                                                                  |
| 4) Engage and interact    | Create motivating and real contexts for communication                                                                                               | a) make requests to the child (talking)<br>b) Uses music (playing and singing)<br>c) facial expressions                                                                                                                                                                                                                                                    |
| 5) Be patient             | Give the child at least three seconds to respond, respecting their turn of speech                                                                   | a) wait and interpret the response the child gives in their own time (speak)<br>b) have no expectation of vocal responses from the child<br>c) Does not wait for her child to respond (speak again)<br>d) Insisting on speech (speaking)                                                                                                                   |

The categories were counted on ELAN<sup>17</sup>, in which the frequency of occurrences of the children's responses for each subcategory was added and the mean frequencies of the mothers' enunciative modes were compared with the mean frequencies of their children's responses. Statistical analyses were also conducted to compare the number of occurrences and the average duration of mothers' and children's enunciative modes.

The categories of the enunciative modes of the participating children in the statistical analysis were: looking at the mother, at the referent object, or at another object; echolalia; stereotypies; pointing; vocalizations/speech; use of AAC; and facial expressions.

The categories of the enunciative modes of the mothers subjected to statistical analysis were chosen based on the language characteristics of children with ASD in the literature and on readings of the requested videos regarding participants' most significant enunciative modes<sup>9;11;13-16</sup>.

## Results

The sociodemographic profile of the mothers shows that they were aged from 38 to 45 years, were married, and had completed higher education. M1 and M2 have one child each and M3 has two children, only one of whom is a participant in this research as the child is diagnosed with ASD.

All children have been involved in speech-language pathology intervention for more than four and a half years and use AAC. C1, a five-year-old girl is minimally vocal, vocalizing only the sound "uh." C2, a nine-year-old boy, produces few single words, short sentences, and echolalia. C3, another nine-year-old boy produces single words.

Of the videos sent by the families to the researcher, only M1 and M3 showed the child using AAC. The contexts of the videos were:

### Dyad C1 and M1

video 1 - the mother plays a piano, her daughter's favorite activity, and the child sometimes requests another song.

video 2 - mother and daughter play with playdough, each sitting in chairs facing each other.

### Dyad C2 and M2

video 3 - mother and son on the beach play swimming together.

video 4 - mother and son make bracelet with beads for his grandmother.

### Dyad C3 and M3

video 5 - mother and son are in the kitchen, the child asks for French fries and they begin preparing them.

video 6 - Mother and son sing an alphabet song on a blackboard.

Tables 1, 2, and 3 show the modes of communication of each mother-child dyad and their respective frequencies.

**Table 1.** Modes of linguistic interaction of Dyad 1 and the occurrence frequencies of the mother's (M1) and the child's (C1) modes of interaction

| Mother's modes of linguistic interaction (M1) |                                                             | Frequency of the mother's interaction modes (M1) | Child's modes of interaction (C1) and frequency | Total frequency of the child's modes (C1) |
|-----------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------|-------------------------------------------|
| Being flexible                                | Changes or adapts to the form/content directed to the child | 14                                               | Vocalizes                                       | 9                                         |
|                                               |                                                             |                                                  | Points                                          | 1                                         |
|                                               |                                                             |                                                  | Grabs object                                    | 2                                         |
|                                               |                                                             |                                                  | Gave no answer                                  | 2                                         |
| Persist in the interaction                    | Calls by name (speak)                                       | 2                                                | No answer                                       | 2                                         |
|                                               | Changes her prosody                                         | 0                                                | Did not happen                                  | 0                                         |
|                                               | Looks at her child                                          | 15                                               | Looks at her mother                             | 4                                         |
|                                               |                                                             |                                                  | Looks at the object                             | 1                                         |
|                                               |                                                             |                                                  | Vocalizes                                       | 7                                         |
|                                               |                                                             |                                                  | Points                                          | 2                                         |
|                                               |                                                             |                                                  | AAC                                             | 1                                         |
|                                               |                                                             |                                                  | Stays                                           | 6                                         |
|                                               |                                                             |                                                  | No answer                                       | 3                                         |
|                                               | Changes her body position to get her child's attention      | 4                                                | Looks and points                                | 4                                         |
|                                               |                                                             |                                                  | Vocalizes and points                            | 0                                         |
|                                               | Takes her child by the hand or holds her on her arms        | 8                                                | Vocalizes                                       | 2                                         |
|                                               |                                                             |                                                  | Looks at the object                             | 1                                         |
|                                               |                                                             |                                                  | No answer                                       | 5                                         |
|                                               | Imitates the child                                          | 0                                                | Did not happen                                  | 0                                         |
|                                               | Asks open-ended questions (speak)                           | 0                                                | Did not happen                                  | 0                                         |
|                                               | Asks closed-ended questions (speak)                         | 6                                                | Points to the object                            | 1                                         |
|                                               |                                                             |                                                  | Tries to leave                                  | 2                                         |
|                                               |                                                             |                                                  | No answer                                       | 3                                         |
|                                               | Get the child's attention by removing the object            | 1                                                | Points and vocalizes to the object              | 1                                         |
| Presume competence                            | Praises the child (speak)                                   | 2                                                | Vocalizes and returns the object                | 2                                         |
|                                               | Assigns meaning to other linguistic expressions (speaking)  | 15                                               | Looks                                           | 3                                         |
|                                               |                                                             |                                                  | Vocalizes                                       | 6                                         |
|                                               |                                                             |                                                  | Points                                          | 5                                         |
|                                               |                                                             |                                                  | AAC                                             | 1                                         |
|                                               | Provides access to AAC                                      | 2                                                | Looks and vocalizes                             | 1                                         |
|                                               |                                                             |                                                  | Facial expression and protests with AAC         | 1                                         |



| Mother's modes of linguistic interaction (M1) |                                                                              | Frequency of the mother's interaction modes (M1) | Child's modes of interaction (C1) and frequency                                                                                          | Total frequency of the child's modes (C1) |
|-----------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Engage and interact                           | Makes requests to her child (talking)                                        | 1                                                | Looks at the object and protests with vocalization                                                                                       | 1                                         |
|                                               | Uses music (playing and singing)                                             | 16                                               | Looks<br>Vocalizes<br>AAC<br>Grabs her mother's arm and tries to leave                                                                   | 4<br>10<br>1<br>1                         |
|                                               | Uses facial expressions                                                      | 9                                                | Looks at her mother<br>Looks at another object and vocalizes<br>Vocalizes and points<br>Vocalizes and AAC<br>Facial expressions<br>Stays | 1<br>4<br>1<br>1<br>1<br>1                |
|                                               |                                                                              |                                                  |                                                                                                                                          | 9                                         |
| Being patient                                 | Waits and interprets the response her child gave her in her own time (speak) | 5                                                | Looks and vocalizes<br>Facial expressions and vocalizations<br>AAC, points, vocalizes, and looks                                         | 4<br>1<br>1                               |
|                                               | Has no expectation of vocal responses from her child                         | 0                                                | Did not happen                                                                                                                           | 0                                         |
|                                               | Does not wait for her child to respond (speak again)                         | 4                                                | Vocalizes, looks at the object<br>Looks at another object<br>Did not answer                                                              | 1<br>2<br>1                               |
|                                               | Insists that her child speak (speak)                                         | 0                                                | Did not happen                                                                                                                           | 0                                         |

Caption: AAC - augmentative and alternative communication; C1 - Child 1; M1 - Mother 1.

The enunciative mode M1 used the most referred to looking at her child, which favored more responses from C1, as in an excerpt from their interaction in video 1.

### Context of video 1 of Dyad 1

M1 plays a piano, C1's favorite activity. C1 sometimes asks her mother for another song. M1 sits in front of a piano and C1 stands next to her, paying attention and holding an AAC symbol.

### Excerpt

*MI*: plays the piano, sings, and *alternately* look at her child and the piano

*CI*: vocalizes, grabs and pulls her mother's arm, and hands over an AAC symbol by which she requests another song

*MI*: she smiles and looks at her child. She stops playing the piano and picks up the symbol

*CI*: vocalizes ("uh") and points again to the symbol, implying that she is reinforcing her request for a song change

*MI*: Mother says "let me find the tone" and smiles at the child, starting to play the piano again.

### Context of video 2 of Dyad 1

M1 is sitting before C1 in a low chair at the latter's height. C1 also sits. The two play with clay and modelling objects.

#### Excerpt

*M1:* The mother says: "look, mom is going to make a big snake" and continues her song, singing "how does the snake climb a lemon tree?"

*C1:* She vocalizes "uh"

*M1:* The mother speaks: "Go"

*C1:* Points to the mobile phone

*M1:* The mother speaks: "Do you want to make pasta?"

*C1:* The child looks at her mother

*M1:* The mother keeps singing: "the snake has no hands," says "do it with this one too," and takes the child's arm to get the playdough

*C1:* Tries to get out of the chair

*M1:* "Look, [child's name], "the snake, the snake"

*C1:* Vocalizes "uh" and tries to leave again

*M1:* Repositions the child and gives her playdough again

Results show that in video 2 of Dyad 1, in which M1 and C1 play with playdough, the mother's enunciative modes included persisting in the interaction, being flexible, changing and adapting the content directed at the child, and praising and looking at the child. However, when C1 pointed and vocalized to refer to something she wants, the mother failed to validate these attempts, insisting on her way of playing and attributing no meaning to the child's linguistic expressions. In other words, the mother shows that she has a certain expectation of her child's response that remains unfulfilled in her view since she insists on an expected response.

The findings indicate that, in video 1, C1 leads the playtime, initiates the interaction via AAC, looks, and vocalizes, and M1 attributes meaning to C1's attempts at expression. Thus, this dyad establishes a more effective communication in this context, with fewer attempts by the mother to get the child's attention or an expected response, as in video 2. Some attempts by M1 to draw her daughter's attention by her name had no effect on C1.

Table 2 describes the results of Dyad 2.



**Table 2.** Modes of linguistic interaction of Dyad 2 and the occurrence frequencies of the mother's (M2) and the child's (C2) modes of interaction

| Mother's modes of linguistic interaction (M2) |                                                                              | Frequency of the mother's interaction modes (M2) | Child's modes of interaction (C2) and frequency | Total frequency of the child's modes (C2) |    |
|-----------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------|-------------------------------------------|----|
| Being flexible                                | Changes or adapts to the form/content directed to the child                  | gave no answer                                   | Looks at his mother                             | 9                                         | 22 |
|                                               |                                                                              |                                                  | Goes towards his mother                         | 3                                         |    |
|                                               |                                                                              |                                                  | No answer                                       | 10                                        |    |
| Persist in the interaction                    | Calls by name (speak)                                                        | 1                                                | Goes towards his mother                         | 1                                         | 1  |
|                                               | Changes her prosody                                                          | 13                                               | Looks at his mother                             | 9                                         | 15 |
|                                               |                                                                              |                                                  | Looks at his mother and laughs                  | 2                                         |    |
|                                               |                                                                              |                                                  | Goes towards his mother                         | 2                                         |    |
|                                               |                                                                              |                                                  | Stereotypes                                     | 2                                         |    |
|                                               | Looks at her child                                                           | 15                                               | Looks at his mother                             | 8                                         | 11 |
|                                               |                                                                              |                                                  | Kisses                                          | 1                                         |    |
|                                               |                                                                              |                                                  | Leaves                                          | 2                                         |    |
|                                               |                                                                              |                                                  | No answer                                       | 4                                         |    |
|                                               | Changes her body position to get her child's attention                       | 9                                                | Looks at his mother                             | 6                                         | 10 |
|                                               |                                                                              |                                                  | Vocalizes                                       | 2                                         |    |
|                                               |                                                                              |                                                  | Stereotypy                                      | 1                                         |    |
|                                               |                                                                              |                                                  | No answer                                       | 3                                         |    |
|                                               | Takes her child by the hand or holds him on her arms                         | 6                                                | Looks at his mother                             | 2                                         | 4  |
|                                               |                                                                              |                                                  | Echolalia                                       | 1                                         |    |
|                                               |                                                                              |                                                  | Gave no answer                                  | 2                                         |    |
|                                               |                                                                              |                                                  | Pulls his mother                                | 1                                         |    |
|                                               | Imitates her child                                                           | 1                                                | Looks at his mother                             | 1                                         | 1  |
|                                               | Asks open-ended questions (speak)                                            | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Asks closed-ended questions (speak)                                          | 2                                                | Responds by going to his mother                 | 1                                         | 2  |
|                                               |                                                                              |                                                  | Gave no answer                                  | 1                                         |    |
|                                               | Gets her child's attention by removing the object                            | 0                                                | Did not happen                                  | 0                                         | 0  |
| Presume competence                            | Praises her child (speak)                                                    | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Assigns meaning to other linguistic expressions (speaking)                   | 15                                               | Looks                                           | 6                                         | 13 |
|                                               |                                                                              |                                                  | Goes towards his mother                         | 4                                         |    |
|                                               |                                                                              |                                                  | Stays                                           | 3                                         |    |
|                                               | Provides access to AAC                                                       | 0                                                | No answer                                       | 2                                         | 0  |
|                                               |                                                                              |                                                  | Did not happen                                  | 0                                         |    |
| Engage and interact                           | Makes requests to her child (talking)                                        | 4                                                | Responds by going to his mother                 | 4                                         | 4  |
|                                               | Uses music (playing and singing)                                             | 9                                                | Looks and sings                                 | 6                                         | 9  |
|                                               |                                                                              |                                                  | looks                                           | 3                                         |    |
|                                               | Uses facial expressions                                                      | 1                                                | Looks and sings                                 | 1                                         | 1  |
| Being patient                                 | Waits and interprets the response her child gave her in his own time (speak) | 5                                                | Approaches his mother and looks                 | 2                                         | 6  |
|                                               |                                                                              |                                                  | Takes it to his mother                          | 1                                         |    |
|                                               |                                                                              |                                                  | Sings                                           | 3                                         |    |
|                                               | Has no expectation of vocal responses from her child                         | 2                                                | Started the song                                | 1                                         | 2  |
|                                               | Does not wait for her child to respond (speak again)                         | 2                                                | Kept singing                                    | 1                                         | 0  |
|                                               |                                                                              |                                                  | No answer                                       | 0                                         |    |
|                                               | Insists that her child speak (speak)                                         | 0                                                | Did not happen                                  | 0                                         | 0  |

Caption: AAC - augmentative and alternative communication; C2 - Child 2; M2 - Mother 2.

In this case, M2 used the mode of *changing or adapting to the form and/or content directed at the child* when the latter fails to respond to the request, favoring C2's response, as in an excerpt from the dialogue transcribed from video 3 below:

### *Context of video 3 of Dyad 2*

Mother and son are on the beach playing swimming together

#### **Excerpt**

M2: [calls the child by name]

C2: He leaves towards another place and vocalizes

M2: She approaches the child, looks at him, takes his arms to her, crouches, and talks to her son

M2: Look at mom! Come... let's go to the waves!

C2: He removes his arm from her mother's hand and looks at her

M2: Let's go? (mother reaffirms her invitation)

As M2, M3 also used the enunciative mood *changing or adapting the form and/or content directed to the child* more often (Table 3).

Moreover, results show that every time the mothers used AAC resources, they encouraged their children's responses, as in an excerpt from an interaction of Dyad 3.

### *Context of video 5 of Dyad 3*

The boy asks his mother for fries.

#### **Excerpt:**

M3: AAC device (tablet) is on the table on which the mother is leaning. As she looked at the device, she favored the child's access

C3: goes towards his mother and shows the symbols corresponding to the sentence: "I want French fries"

M3: looks at the device and repeats: "Fries... Thank you, son."

**Table 3.** Modes of linguistic interaction of Dyad 3 and the occurrence frequencies of the mother's (M3) and the child's (C3) modes of interaction

| Mother's modes of linguistic interaction (M2) |                                                                              | Frequency of the mother's interaction modes (M3) | Child's modes of interaction (C3) and frequency | Total frequency of the child's modes (C3) |    |
|-----------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------|-------------------------------------------|----|
| Being flexible                                | Changes or adapts to the form/content directed to the child                  | 16                                               | Looks                                           | 5                                         | 16 |
|                                               |                                                                              |                                                  | Approximate word                                | 9                                         |    |
|                                               |                                                                              |                                                  | AAC                                             | 2                                         |    |
| Persist in the interaction                    | Calls by name (speak)                                                        | 1                                                | Looks                                           | 1                                         | 1  |
|                                               | Changes her prosody                                                          | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Looks at her child                                                           | 2                                                | Looks at his mother                             | 0                                         | 2  |
|                                               |                                                                              |                                                  | Looks at the object                             | 0                                         |    |
|                                               | Changes her body position to get her child's attention                       | 1                                                | Looks and sings                                 | 1                                         | 1  |
|                                               | Takes the child by the hand or holds him on their arms                       | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Imitates her child                                                           | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Asks open-ended questions (speak)                                            | 3                                                | Looks                                           | 1                                         | 3  |
|                                               |                                                                              |                                                  | AAC                                             | 1                                         |    |
|                                               |                                                                              |                                                  | Vocalizes and goes to the object                | 1                                         |    |
|                                               | Asks closed-ended questions (speak)                                          | 5                                                | Looks                                           | 1                                         | 5  |
|                                               |                                                                              |                                                  | Responds with word approximation                | 3                                         |    |
| Presume competence                            | Gets her child's attention by removing the object                            | 0                                                | Points                                          | 1                                         | 0  |
|                                               |                                                                              |                                                  | Did not happen                                  | 0                                         |    |
|                                               | Praises her child (speak)                                                    | 2                                                | Looks                                           | 2                                         | 2  |
|                                               | Assigns meaning to other linguistic expressions (speaking)                   | 9                                                | Looks and vocalizes                             | 9                                         | 9  |
| Engage and interact                           | Provides access to AAC                                                       | 2                                                | Looks at his mother and request with AAC        | 2                                         | 2  |
|                                               | Makes requests to her child (talking)                                        | 1                                                | Responds to the request                         | 1                                         | 1  |
|                                               | Uses music (playing and singing)                                             | 3                                                | Looks and sings                                 | 3                                         | 3  |
| Being patient                                 | Uses facial expressions                                                      | 0                                                | Did not happen                                  | 0                                         | 0  |
|                                               | Waits and interprets the response her child gave her in his own time (speak) | 7                                                | Sings and kisses                                | 1                                         | 7  |
|                                               |                                                                              |                                                  | Word approximation                              | 3                                         |    |
|                                               |                                                                              |                                                  | AAC                                             | 2                                         |    |
|                                               | Has no expectation of vocal responses from her child                         | 3                                                | Word approximation sings                        | 2                                         | 3  |
|                                               | Does not wait for her child to respond (speak again)                         | 5                                                | Looks                                           | 1                                         |    |
|                                               |                                                                              |                                                  | Word approximation                              | 2                                         | 5  |
|                                               | Insists that her child speak (speak)                                         | 4                                                | No answer                                       | 2                                         |    |
|                                               |                                                                              |                                                  | Looks and uses word approximation               | 4                                         | 4  |

Caption: AAC - augmentative and alternative communication; C3 - Child 3; M3 - Mother 3.

Table 4 compares the total and mean modes of enunciation of the mothers' and the children's responses.

**Table 4.** Comparison of the enunciative modes between the mothers' and their children's responses

| Mothers' modes of linguistic interaction |                                                                                | Total number of frequencies of the mothers' modes of enunciation | Mothers' mean frequencies | Total number of the frequencies of children's enunciation modes | Children's mean frequencies |
|------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------|-----------------------------|
| Being flexible                           | Changes or adapts to the form/content directed to the child                    | 52                                                               | 52                        | 50                                                              | 50                          |
| Persist in the interaction               | Calls by name (speak)                                                          | 4                                                                | 10.5                      | 2                                                               | 9.7                         |
|                                          | Change her prosody                                                             | 13                                                               |                           | 15                                                              |                             |
|                                          | Looks at her child                                                             | 32                                                               |                           | 34                                                              |                             |
|                                          | Changes her body position to get her child's attention                         | 10                                                               |                           | 15                                                              |                             |
|                                          | Takes her child by their hand or holds them on her arms                        | 14                                                               |                           | 7                                                               |                             |
|                                          | Imitates her child                                                             | 1                                                                |                           | 1                                                               |                             |
|                                          | Asks open-ended questions (speak)                                              | 3                                                                |                           | 3                                                               |                             |
|                                          | Asks closed-ended questions (speak)                                            | 13                                                               |                           | 10                                                              |                             |
|                                          | Gets her child's attention by removing the object                              | 1                                                                |                           | 1                                                               |                             |
| Presume competence                       | Praises her child (speak)                                                      | 4                                                                | 15.6                      | 4                                                               | 15                          |
|                                          | Assigns meaning to other linguistic expressions (speaking)                     | 39                                                               |                           | 37                                                              |                             |
|                                          | Provides access to AAC                                                         | 4                                                                |                           | 4                                                               |                             |
| Engage and interact                      | Makes requests to her child (talking)                                          | 6                                                                | 14.6                      | 6                                                               | 18                          |
|                                          | Uses music (playing and singing)                                               | 28                                                               |                           | 38                                                              |                             |
|                                          | Uses facial expressions                                                        | 10                                                               |                           | 10                                                              |                             |
| Being patient                            | Waits and interprets the response her child gave her in their own time (speak) | 17                                                               | 9.25                      | 18                                                              | 8.7                         |
|                                          | Has no expectation of speech                                                   | 5                                                                |                           | 5                                                               |                             |
|                                          | Does not wait for her child to respond (speak again)                           | 11                                                               |                           | 8                                                               |                             |
|                                          | Insists that her child speak (speak)                                           | 4                                                                |                           | 4                                                               |                             |

Caption: AAC: Supplementary and Alternative Communication.

The enunciative modes the mothers use, in total, more often coincides with those that correspond to the highest frequency of their children's responses, namely: *changing and/or adapting to the form/content directed to the child, looking at the child, assigning meaning to other linguistic expressions, and using music as an incentive.*

Results show that the mothers' enunciative modes that failed to favor more responses from the children included *taking the child by the hand or holding them in their arms, using closed-ended questions, and failing to wait for the child to answer.*

Findings indicate the children's multimodal responses to their mothers' enunciative modes as they responded in various ways, such as: *gaze, vocalizations, word approximations, AAC resources, and body movements.*

Although the mothers rarely favored the use of AAC tools, the children positively responded to all opportunities, as they used such resources. For some of the mothers' enunciative modes, the children use AAC as a response (see Tables 1, 2, 3,

and 4) when the mothers *changed and/or adapted to the form and content directed at their children, looked at the children, asked open-ended questions, attributed meaning to linguistic expressions, used music, expressed pleasure to the child's answer, and waited for and interpreted the answer their child gave them in their own time.*

In addition to M1 providing access to AAC, C1 used it when M1 looked at her and attributed meaning to her other linguistic expressions as she nudged and looked at their mother. M1 looked at C1 and used AAC to ask for her favorite song. In addition to the examples above, C3 initiated an interaction by asking M3 for French fries.

All dyads used music, as per the video recordings, evincing it as one of the main ways the mothers used to gain and maintain their children's attention, who produce a greater and different number of enunciative acts in response.

Table 5 shows the results of the statistical analysis of the mothers' enunciative modes regarding their frequency of occurrence and average duration.

**Table 5.** Frequency of occurrence and average duration of the mothers' enunciative modes

|                                        |                                                           | Mean  | Median | Standard Deviation | N | CI   | P-value |
|----------------------------------------|-----------------------------------------------------------|-------|--------|--------------------|---|------|---------|
| Occurrences per minute                 | Points                                                    | 0.12  | 0.00   | 0.30               | 6 | 0.24 | 0.006*  |
|                                        | Facial expressions                                        | 1.32  | 0.12   | 2.57               | 6 | 2.06 |         |
|                                        | Speaks                                                    | 11.18 | 9.34   | 7.03               | 6 | 5.62 |         |
|                                        | Changes her body position to get her child's attention    | 1.40  | 0.37   | 2.54               | 6 | 2.03 |         |
|                                        | Uses music                                                | 2.69  | 2.03   | 2.79               | 6 | 2.23 |         |
|                                        | Looks at the child                                        | 3.32  | 1.72   | 4.91               | 6 | 3.93 |         |
|                                        | Takes her child by their hand or holds them on their arms | 0.63  | 0.00   | 1.02               | 6 | 0.82 |         |
| Duration per occurrence (sec) / minute | Points                                                    | 0.01  | 0.00   | 0.04               | 6 | 0.03 | 0.091   |
|                                        | Facial expressions                                        | 2.91  | 0.60   | 4.19               | 6 | 3.35 |         |
|                                        | Speaks                                                    | 2.31  | 1.67   | 1.89               | 6 | 1.51 |         |
|                                        | Changes her body position to get her child's attention    | 0.50  | 0.04   | 0.75               | 6 | 0.60 |         |
|                                        | Uses music                                                | 2.91  | 0.80   | 4.35               | 6 | 3.48 |         |
|                                        | Looks at her child                                        | 1.22  | 1.31   | 1.10               | 6 | 0.88 |         |
|                                        | Takes her child by their hand or holds them on her arms   | 0.33  | 0.00   | 0.52               | 6 | 0.42 |         |

Caption: Mann-Whitney test with a  $p < 0.05$  significance level.

Table 5 shows a statistically significant difference between the enunciative modes regarding their number of occurrences ( $p$ -value = 0.006). In other words, the mothers' more frequent enunciative included "*speaking*" (mean of 11.18), followed by "*looking at their child*" (mean of 3.32) and "*music*" (mean of 2.69), i.e., these enunciative modes occur more often than the others.

The enunciative modes showed no statistically significant differences regarding duration ( $p$ -value=0.091), evincing that no enunciative modes from the mothers lasted longer than the others.

Table 6 shows the results of the statistical analysis of the children's enunciative modes regarding their frequency of occurrence and average duration.

**Table 6.** Frequency of occurrence and average duration of the children' enunciative modes

|                                        |                                        | Mean | Median | Standard Deviation | N | CI   | P-value |
|----------------------------------------|----------------------------------------|------|--------|--------------------|---|------|---------|
| Occurrences per minute                 | Points                                 | 1.90 | 0.96   | 3.10               | 6 | 2.48 | 0.002*  |
|                                        | Echolalia                              | 0.64 | 0.00   | 1.02               | 6 | 0.81 |         |
|                                        | Stereotypies                           | 0.16 | 0.00   | 0.38               | 6 | 0.31 |         |
|                                        | Facial expressions                     | 0.96 | 0.49   | 1.19               | 6 | 0.95 |         |
|                                        | Speech/vocalization                    | 8.84 | 5.03   | 11.15              | 6 | 8.92 |         |
|                                        | The child looks at their mother        | 5.39 | 5.87   | 2.27               | 6 | 1.81 |         |
|                                        | The child looks at the referent object | 2.07 | 1.44   | 2.32               | 6 | 1.86 |         |
|                                        | The child looks at another object      | 0.62 | 0.30   | 0.76               | 6 | 0.61 |         |
|                                        | Child's AAC use                        | 0.65 | 0.00   | 1.30               | 6 | 1.04 |         |
| Duration per occurrence (sec) / minute | Points                                 | 1.53 | 0.76   | 1.95               | 6 | 1.56 | 0.076   |
|                                        | Echolalia                              | 0.87 | 0.00   | 1.97               | 6 | 1.58 |         |
|                                        | Stereotypies                           | 0.29 | 0.00   | 0.70               | 6 | 0.56 |         |
|                                        | Facial expressions                     | 0.74 | 0.51   | 0.84               | 6 | 0.67 |         |
|                                        | Speech/vocalization                    | 0.93 | 0.45   | 1.42               | 6 | 1.13 |         |
|                                        | The child looks at their mother        | 2.15 | 1.00   | 2.41               | 6 | 1.93 |         |
|                                        | The child looks at the referent object | 2.52 | 1.83   | 2.48               | 6 | 1.98 |         |
|                                        | The child looks at another object      | 0.46 | 0.32   | 0.59               | 6 | 0.47 |         |
|                                        | Child's AAC use                        | 0.63 | 0.00   | 1.13               | 6 | 0.90 |         |

Caption: Mann-Whitney test with a  $p < 0.05$  significance level.

Results show that, as with the mothers, the occurrences of the children's enunciative modes obtained statistical significance between modes ( $p$ -value = 0.002), and that the children used "*speech/vocalization*" (mean of 8.84) and "*look at their mother*" (mean of 5.39) more often than "*looking at other referent objects*" (mean of 0.67) or "*referent objects*" (mean of 2.07). The enunciative modes showed no statistically significant differences regarding their duration ( $p$ -value=0.076), evincing that no children's enunciative modes lasted longer than the others.

Echolalia (0.64) and stereotypies (0.16) occurred scarcely. "*Looking at their mother*" occurred more often than the "*looking at the referent object*" or "*looking at another object*."

Table 7 shows the number of occurrences and average duration of the modes of linguistic interaction in common between mothers and their children. This study found no statistically significant differences in average duration or number of occurrences, i.e., mothers and their children showed equal occurrences and duration between their modes of linguistic interactions.

**Table 7.** Comparison between the number of occurrences and average duration of mothers and children by modes of linguistic interaction. (Common response between groups)

|                                              |        | Number of occurrences |        |       |   |      | P-value |
|----------------------------------------------|--------|-----------------------|--------|-------|---|------|---------|
|                                              |        | Mean                  | Median |       | N | CI   |         |
| Points                                       | Mother | 0.12                  | 0.00   | 0.30  | 6 | 0.24 | 0.109   |
|                                              | Child  | 1.90                  | 0.96   | 3.10  | 6 | 2.48 |         |
| Facial expressions                           | Mother | 1.32                  | 0.12   | 2.57  | 6 | 2.06 | 0.893   |
|                                              | Child  | 0.96                  | 0.49   | 1.19  | 6 | 0.95 |         |
| Speech/vocalization                          | Mother | 11.18                 | 9.34   | 7.03  | 6 | 5.62 | 0.500   |
|                                              | Child  | 8.84                  | 5.03   | 11.15 | 6 | 8.92 |         |
| The mother looks at the child and vice-versa | Mother | 3.32                  | 1.72   | 4.91  | 6 | 3.93 | 0.345   |
|                                              | Child  | 5.39                  | 5.87   | 2.27  | 6 | 1.81 |         |
|                                              |        | Average Duration      |        |       |   |      | P-value |
|                                              |        | Mean                  | Median |       | N | CI   |         |
| Points                                       | Mother | 0.01                  | 0.00   | 0.04  | 6 | 0.03 | 0.068   |
|                                              | Child  | 1.53                  | 0.76   | 1.95  | 6 | 1.56 |         |
| Facial expressions                           | Mother | 2.91                  | 0.60   | 4.19  | 6 | 3.35 | 0.345   |
|                                              | Child  | 0.74                  | 0.51   | 0.84  | 6 | 0.67 |         |
| Speech/vocalization                          | Mother | 2.31                  | 1.67   | 1.89  | 6 | 1.51 | 0.173   |
|                                              | Child  | 0.93                  | 0.45   | 1.42  | 6 | 1.13 |         |
| The mother looks at the child and vice-versa | Mother | 1.22                  | 1.31   | 1.10  | 6 | 0.88 | 0.463   |
|                                              | Child  |                       |        |       |   |      |         |

Caption: Mann-Whitney test with a  $p < 0.05$  significance level.

Despite no statistically significant differences between mothers and children regarding duration and occurrence, these groups qualitatively used speech and vocalization more often (a 11.18 mean for mothers and an 8.84 mean for children).

## Discussion

Mothers used *changing or adapting to the form or content* by speech directed at their children as an enunciative mode the most (see Table 4 and Table 5). This approach also elicited a higher frequency of responses from their children (Table 4), evincing the effectiveness of these enunciative modes to favor the language of the studied children. A previous study has shown that when children have restricted speech — using body movements, gestures, or pointing more often — communication partners tend to formulate and express their own message, insisting on their interactions<sup>19</sup>.

Another enunciative mode the mothers in this study used the most and which also obtained a higher frequency of response from their children refers to *presume competence*, in which they attributed meaning to their children's expressions. Some authors highlight that communication partners who pay attention to other forms of linguistic expressions, signifying and offering quality and

motivational interactions, are considered good communication partners<sup>20</sup>, corroborating the results in this research and evincing the value of these strategies. One hypothesis that may account for these findings is that the mothers had been engaged in the speech-language pathology therapy of their children, demonstrating awareness and application with respect to these aspects."

In this study, the context of play and the child's motivation influenced their responses in their interaction with their mother, as in a study with non-vocal children with congenital Zika virus syndrome<sup>21</sup>. In the example in which the mother plays the piano for her child — i.e., in the context of play —, she showed fewer attempts to get her child's attention, avoiding insisting on an answer and attributing meaning to her child's attempts at linguistic expressions, favoring language and interaction. This differs from the context in which the mother chose a certain activity and insisted on an answer, attributing no meaning to her children's linguistic expressions and seeming to presume her child's poor competence, as in other studies<sup>9</sup>.

A study has explained participants' insistence on an answer based on their excessive dependence on requests on children with ASD<sup>22</sup>, which makes it difficult for the children to initiate communication or to independently respond to a communication



proposal, hindering a more frequent use of AAC. Communication partners may also fail to give the children the appropriate time to respond to an independent communication proposal. This further reinforces partners' level of competence in the language and interaction process of children living with ASD, who use AAC, and have restricted speech. The speech-language pathologist must find and consider the barriers and facilitators for each child so they can work together with the communication partners in their lives to favor language<sup>20</sup>.

The statistical results on the children's enunciative modes show the multimodal language of children diagnosed with autism, i.e., the use of speech/vocalizations as the children's most common response and the use of facial expression, gaze, stereotypies, echolalia, and AAC. The issue of multimodality remains scarcely discussed in the literature, as per Oliveira<sup>23</sup>.

One of the most frequently linguistic features in the literature on autism<sup>23</sup>, such as echolalia and stereotypies, scarcely occurred in this study as only one child used them. However, a study<sup>23</sup> has deemed the functioning of echolalia as an expression of the heterogeneity of each subject's speech. Its author points out that, even if resembling the other's speech, the specificities in the subject "repeating the speech" must be considered as part of one's own speech, as it may have intonations absent in that of the other<sup>23</sup>. Furthermore, our study considered the found stereotypies as multimodal and enunciative resources, i.e., they belong to the child's language, functioning as enunciative modes<sup>24</sup>.

Based on the family's perspective, some studies have advocated in speech and language therapy and the AAC use according to multimodal<sup>23-25</sup> or idiosyncratic<sup>23</sup> communication to understand the real needs of people with ASD and related complex communication requirements. The clinical communicative environment differs from the household, compromising attempts to "export" interventions from the clinical context to the family environment, with different communication partners and opportunities in each environment. A study<sup>25</sup> has shown that, although parents and family members know their choices differ from the recommended professional aspects, idiosyncratic fast communication has advantages, including speed and simplicity. This may be one of the hypotheses to explain why

AAC is not the most used strategy in this study, as discussed by these authors.

Another hypothesis for the low AAC use in this study stems from the fact that, as in the literature, using AAC not only consists of guidance with communication partners, but also placing these partners in the therapeutic context<sup>26</sup> [...] "*Learning is a complex activity that takes place via experimentation, not just by listening to how it is done*"<sup>26</sup>. As another study states, it is necessary to describe family characteristics, the paths they take to make decisions about their individual interests and collective goals in a broader approach; their use of time and resources to successfully implement AAC should also be accounted<sup>27</sup>. In other words, for greater effectiveness in working with AAC, professionals must collaborate with families and the subjects using AAC throughout the AAC-related decision-making process based on associated evaluations and interventions according to the perspective of the family, their dynamics, and the communication relationships between children and their families, communication partners, and greatest needs in this environment.

Another hypothesis that seems to justify the scarce use of AAC in this study refers to the mother's strategy of avoiding waiting for her child's response, reducing the communicative initiative with AAC. On the other hand, mothers waiting for and interpreting the child's response in their own time (M1 and M3) or asking open questions (M3) favored their child's answers and their initiative to AAC in interactions<sup>9</sup>.

As mentioned, mother used AAC less than other strategies, but every time they did so, their children responded by either requesting or protesting via AAC, looking at their mother, and vocalizing. In other words, as per the literature, AAC use significantly improves shared attention and the development of social communication<sup>28</sup>.

Another enunciative mode the mothers often used but which led to few responses from their children refers to taking the child by their hand or taking them in their arms. In other words, the vocal communication partner tends to dominate linguistic interactions due to the interlocutor's restricted speech, creating an unfulfilled response expectation in the former's view who then insists on an answer, as previously described in literature<sup>20</sup>.

A barrier in the literature to AAC refers to parents' concern that it may substitute or hinder their

children's development of spoken language<sup>22,25</sup>. Notably, in this study, the frequency of the category *Having no expectation of oral responses from their children* exceeded expectations. A hypothesis for this result refers to the fact that the children received speech-language pathology follow-ups and that the mothers were undergoing the process to demystify the notion that AAC inhibits speech. This evinces the importance of joint action between professionals and mothers and a continuous and systematic approach toward AAC and its role in favoring the language and speech of children such as those in this study.

Statistical results show that children look more often at their mothers than at objects. A study that also used ELAN to evaluate children at risk for ASD<sup>29</sup> found that they divert their gaze from their interlocutors, turning it toward toys, contradicting our findings. However, the children in this study averaged two years in a multidisciplinary follow-up at a specialized institution, highlighting the relevance and role of multidisciplinary therapeutic follow-up including physical therapy, psychology, psycho-pedagogy, and occupational therapy for the development of children with ASD, which may have contributed to the outcome.

The mothers in this study often looked at their children and used music to favor language, obtaining more responses from their children. A study<sup>30</sup> on the use of music also showed that it enhances interactions, specifically gaze and shared attention. Mothers look at their children as a strategy since their first interactions with their offspring's life. As mothers usually configure the main interlocutors of babies since their first months of life, they use several enunciative interaction modes<sup>26</sup>, including gazing, gesturing, facial and bodily expressions, and speech.

## Conclusion

Results show the enunciative modes that the mothers in this study used with their children living with ASD, restricted speech, and who use AAC. The following modes favored children's responses: being flexible (changing and/or adapting the form/content directed to the child); presume competence (attributing meaning to the other's linguistic expressions), persist in the interaction (looking at the child); engaging and interacting using music as encouragement), and being patient (waiting for

and interpreting the response the child they gave in their own time).

The enunciative modes the mothers used the most in this research promoted the most responses from their children. This may have stemmed from the speech-language pathology support offered to mothers resulting in greater awareness of the ways that favor the language of their children (or fail to do so).

To our knowledge, literature has no studies about the modes of linguistic interaction of the mothers of children with ASD, reaffirming the importance of the findings in this research despite their inability to be generalized due to the size of the sample in this study.

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