A Psycholinguistic Training to Improve Expressive Language Among Children with ASD

Психолінгвістичний тренінг як засіб розвитку експресивного мовлення дітей з синдромом аутистичного спектра

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ABSTRACT

Purpose. The purpose was to investigate the effect of a psycholinguistic training to improve expressive language among children with ASD.

Methods. Data were collected from children during the academic year 2021–2022. The participants were 20 children with ASD, aged 7 to 10 years, who were enrolled in a school for children with ID. All children attended the same semester inside the school. Parent consent forms were sent home by the principal and school psychologist to the parents of the prospective participants to inform them about the study and ask them to give permission for their children to participate. Demographic information was obtained from school records and as reported by families. Children were divided randomly into two groups: one experimental (n=10) and other was the control group.
group (n=10). These children were matched as a group with cases on the basis of age, IQ, social class and general level of language ability. A 24 items, six-dimensional Questionnaire was developed in particular for this study. The intention was to identify expressive language skills for children with ASD. The six dimensions are: speaking and questioning skills in correct language (4 items), the ability to verbally express things, needs, and desires (4 items), the skill of pronouncing and imitating words, letters and sounds (4 items), repetition and arranging skill (4 items), the ability to verbally express feelings (4 items), the ability to respond to the speech and questions of others.

**Results.** Results indicated increased speaking and questioning skills in correct language, the ability to verbally express things, needs, and desires, the skill of pronouncing and imitating words, letters and sounds, repetition and arranging skill, the ability to verbally express feelings and the ability to respond to the speech and questions of others.

**Conclusions.** Overall, results from this study contribute to the growing literature on the effect of a psycholinguistic training to improve expressive language among children with ASD. The present study lends empirical support to the notion that expressive language of children with ASD can be improved through a psycholinguistic training.

**Key words:** psycholinguistic training, expressive language, children with ASD, imitating words.

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**Introduction**

Autism spectrum disorders (ASD) is characterized by deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication (Al Jaber, 2017; Eissa, 2018).

One of the most important things that can be clearly observed in the child with ASD, which constitutes one of the main deficiencies he/she suffers from, is that his/her language grows slowly or may not grow at all if he/she is left without rehabilitation programs (Błeszyński, 2019). He/she uses words without having a clear specific meaning. He/she often makes meaningless repetitions of words or phrases uttered by another person, and most often we find him/her using signs instead of words. He/she does not use speech to communicate meaningful (Eissa, 2016, 2017; Eissa & Borowska-Beszta, 2019; Mostafa, 2018).
Hence, the child with ASD has a deficiency in linguistic competence in general and verbal in particular (Mahmoud, 2015), which causes a barrier between the child and the surrounding world, and he loses the window of sight on the world around him/her, loses his/her childhood without living like his/her normally developed peers (Eissa, 2015), which shows him/her an internal feeling of insecurity, because they are exposed to social situations, for which they are not well-prepared (El Sayed, 2019; Soliman, 2014).

Therefore, verbal communication skills, which include reception, expression languages, and non-verbal communication skills, are necessary to participate in social interaction (El Fadl, 2014), and to communicate in social situations (Eissa, 2018). They require interactive language activities that excite the child and develop his/her skills.

**Employing Psycholinguistic Activities to Improve Expressive Language Skills**

Psycholinguistic activities are the best programs (Alfaifi & Saleem, 2022) to deal with children with ASD, as they are characterized by the lack of verbal and non-verbal communication in general and expressive language in particular. These activities are the most common means through which the child interacts with the surrounding environment, thus we can reduce the child’s language deficiency and develop his/her expressive skills to achieve the required verbal communication (Ali, 2022). Speech features in autistic disorders are manifestations of qualitative disorders of communication and socialization. The general stereotyped behavior and activity of people with autism are reflected in such speech phenomena as echolalia and verbal rituals (Belyaeva, 2020). Among the features of expressive speech in autism spectrum disorders, it is customary to distinguish echolalia, verbal rituals, the use of neologisms and idiosyncratic speech, the misuse of personal pronouns and verb endings (Akhmetzyanova, Artemieva & Gryaznova, 2021). These children exhibit very unusual language and communication patterns, such as stereotyped speech, and odd and ritualistic behaviors (Ibrahimagic et al., 2021).

**Musical Language Activities**

Musical language activities can encourage the child to use different language and words and improve verbal communication.
This can contribute to acquiring many verbal skills such as pronouncing words and sentences (Accordino, Comer & Heller, 2007). Teacher can also work to make the child recognize and imitate the sounds of birds and animals (Judd, 2015). The teacher can also help the child recognize the sounds of birds and animals and imitate them by using music once and by using the audio recorder again. She also trains them to use musical sounds that express things and develops listening skills as an important cognitive linguistic receiver and focus by hearing the sounds of music which expresses the linguistic meaning verbal purpose. (Dieringer, Porretta & Sainato, 2017). The teacher can repeat the song which includes a dialogue between animals where the children can talk about each animal saying its name, its size and where it lives (in the field at home) and imitates its voice after saying the animal’s name (Judd, 2015) – children can wear a mask or a picture of the animal during the song is to reinforce the identification of different animals. (Attar, Al-Hroub & El Zein, 2022)

**Narrative Language Activities**

Using and employing language correctly in different situations in multiple ways is one of the basics of story activities where dialogue and discussion are mastered (Al Sawi, 2014). The child also develops the ability to deduce and analyze the events of these stories and their characters, in addition to the fact that through the story activities the child can describe images as well as express them (Al Atyya, 2014).

The story should contain a set of situations that the child goes through at school, at home, and in social life in general (Al Sayed, 2018). It provides the child with examples of acceptable social behavior, and the foundations of proper behavior according to these situations depicted in cards, which collectively constitute social stories that are sequenced in their events (Eissa, 2016). At the end of each story, the typical sound behavior is presented so that it is asked to simulate the behavior that was presented in the story (Al Atyya, 2014). These stories must be built so that each one contains four types of sentences: descriptive, perceptive, guiding and control sentences (Al Sayed, 2018), so that the story begins with a descriptive sentence, and it is taken into account that the story does not have abstract meanings or has many events, with the need to specify the purpose of using the story and the shortcomings that the child suffers from and involve several
senses during the process of communicating the story (Mohammed & Mostafa, 2012).

**Problem Statement**

The research problem lies in the low verbal and expressive communication skills of autism spectrum children, which can be improved by using the language activities practiced by students in the classroom, as it is a microcosm of those activities in the community. Therefore students’ language skills must be refined in a variety of language activities within the school. They are given the opportunity to practice these language skills. All these children suffer from difficulties in language and communication if they are not provided with programs and training activities.

This study seeks to give answers to the following question:
(1). Are there difference in average of speaking and questioning skills in correct language subtest scores in pre-post testing for the experimental group?
(2). Are there difference in average of the ability to verbally express things, needs, and desires subtest scores in pre-post testing for the experimental group?
(3). Are there difference in average of pronouncing and imitating words, letters and sounds subtest scores in pre-post testing for the experimental group?
(4). Are there difference in average of repetition and arranging skill subtest scores in pre-post testing for the experimental group?
(5). Are there difference in average of the ability to verbally express feelings subtest scores in pre-post testing for the experimental group?
(6). Are there difference in average of the ability to respond to the speech and questions of others subtest scores in pre-post testing for the experimental group?

**Purpose**

The purpose was to investigate the effect of a psycholinguistic training to improve expressive language among children with ASD.
**Method**

This study seeks to provide an answer to the question on what is the effect of a psycholinguistic training to improve expressive language among children with ASD. Data were collected from children during the academic year 2021–2022.

**Participants**

The participants were 20 children with ASD, aged 7 to 10 years, who were enrolled in a school for children with ID. All children attended the same semester inside the school. Parent consent forms were sent home by the principal and school psychologist to the parents of the prospective participants to inform them about the study and ask them to give permission for their children to participate. Demographic information was obtained from school records and as reported by families. Children were divided randomly into two groups: one experimental (n=10) and other was the control group (n=10). These children were matched as a group with cases on the basis of age, IQ, social class and general level of language ability.

**Research Model**

The research used the quasi-experimental approach due to its suitability to the nature of the research, which relies on the experimental design based on two groups, one experimental and the other control, and by using the pre- and post testing of the two groups (see fig. 1).
Data Collection Instrument

A 24 items, six-dimensional Questionnaire was developed in particular for this study. The intention was to identify expressive language skills for children with ASD. The six dimensions are: speaking and questioning skills in correct language (4 items), the ability to verbally express things, needs, and desires (4 items), the skill of pronouncing and imitating words, letters and sounds (4 items), repetition and arranging skill (4 items), the ability to verbally express feelings (4 items), the ability to respond to the speech and questions of others*.

The internal consistency of the scale was measured through Cronbach’s alpha estimated at 0.91 for the whole scale: 0.88 for speaking and questioning skills in correct language, 0.89 for the ability to verbally express things, needs, and desires, 0.87 for the skill of pronouncing and imitating words, letters and sounds, 0.85 for repetition and arranging skill, 0.88 for the ability to verbally express feelings and 0.85 for the ability to respond to the speech and questions of others (see Table 1). The content validity of the scale was examined by a group of 5 experts. They assessed the relevance of each item using a four-point Likert scale (where 1 represents “irrelevant” and 4 represents “highly relevant”). They provided suggestions and comments. The 20 items were judged to be quite or highly relevant. A content validity index was calculated at the item level (I-CVI = 0.90).

Table 1
Reliability coefficients using Cronbach’s alpha method

<table>
<thead>
<tr>
<th>Scale/Subscales</th>
<th>Reliability coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking and questioning skills in correct language</td>
<td>0.88</td>
</tr>
<tr>
<td>The ability to verbally express things, needs, and desires</td>
<td>0.89</td>
</tr>
<tr>
<td>The skill of pronouncing and imitating words, letters and sounds</td>
<td>0.87</td>
</tr>
<tr>
<td>Repetition and arranging skill</td>
<td>0.85</td>
</tr>
<tr>
<td>The ability to verbally express feelings</td>
<td>0.88</td>
</tr>
<tr>
<td>The ability to respond to the speech and questions of others</td>
<td>0.85</td>
</tr>
<tr>
<td>Scale</td>
<td>0.91</td>
</tr>
</tbody>
</table>

* The questionnaire is upon request from the author
Procedure

All children were diagnosed according to previously determined criteria and were fully assessed on language tests before and after treatment. The experimental group consisted of 10 boys, between the ages of 7 and 10 years. All were free from overt neurological damage or other complicating factors such as deafness. The Non-Verbal IQ of all the children, as assessed by the WISC was 60 or above. The psycholinguistic training program was designed for each child according to his level of ability and were based on psycholinguistic research with normal children. Through musical language activities, the child learns many verbal skills such as pronouncing words and sentences. The instructor helps the child recognize the sounds of birds and animals and imitate them, using music once and using the audio recorder again. He trains children to use musical sounds that express things and develops in them the skill of listening as a cognitive linguistic receiver. This is done by listening to the sounds of music that express the purposeful verbal linguistic meaning. The instructor chants the next song, which includes a dialogue between the animals, where the children can talk about each animal that pronounces its name, its size and where it lives (in the field – at home) and imitates its voice after pronouncing the animal's name. Children are trained using story telling which is based on a set of situations that the child goes through at school, at home, and in social life in general. Story telling (Ahmed, 2016; Mostafa, 2016; Tatlı, Selçuk & Gülay, 2022) provides the child with examples of acceptable social behavior, and the foundations of proper behavior. At the end of each story, the correct model behavior is presented and asked to simulate the behavior presented in the story. Through the narrative activity, the instructor presents the class with all the importance of greeting, and then presents a short cartoon film entitled (Saying hello), and the story of the film revolves around a child entering the store to buy sweets without being greeted. One of the children enters the classroom and says hello in a clear and audible voice. The instructor alerts the autistic child to hear and imitate his classmate. Then the instructor asks the autistic child to enter the class and say hello) if the child does not respond, he performs verbal memorization (when we enter the classroom we say: Good morning/hello, etc. Treatment lasted for 18 weeks. Assessment of many aspects of children's language were carried out prior to treatment and at 18 weeks intervals thereafter. Classroom teacher was trained in
the use of reinforcement, prompting and fading techniques to increase the child's use of appropriate, communicative speech. All training was carried out by the child's classroom teacher at the classroom.

Results

Hypotheses Testing

To compare whether there is a difference in the dependent variable for the two independent groups, the Mann-Whitney U test was used. Table 2 shows that (Z) values were as follows: speaking and questioning skills in correct language -3.171, P < 0.01), the ability to verbally express things, needs, and desires (-3.659, P < 0.01), the skill of pronouncing and imitating words, letters and sounds (-3.673, P < 0.01), repetition and arranging skill (-3.682, P < 0.01), the ability to verbally express feelings and (-3.695, P < 0.01), and the ability to respond to the speech and questions of others (-3.695, P < 0.01). These values are significant at the level (0.01) in the favor of experimental group.

Table 2

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>N</th>
<th>Mean Ranks</th>
<th>Sum Ranks</th>
<th>U</th>
<th>Z Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>speaking and questioning skills in correct language</td>
<td>Ex</td>
<td>10</td>
<td>14.45</td>
<td>144.5</td>
<td>10.5</td>
<td>-3.171</td>
<td>0.01**</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>10</td>
<td>6.55</td>
<td>65.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ability to verbally express things, needs, and desires</td>
<td>Ex</td>
<td>10</td>
<td>15.15</td>
<td>151.5</td>
<td>3.5</td>
<td>-3.659</td>
<td>0.01**</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>10</td>
<td>5.85</td>
<td>58.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the skill of pronouncing and imitating words, letters and sounds</td>
<td>Ex</td>
<td>10</td>
<td>15.15</td>
<td>151.5</td>
<td>3.5</td>
<td>-3.673</td>
<td>0.01**</td>
</tr>
<tr>
<td>repetition and arranging skill</td>
<td>Cont.</td>
<td>10</td>
<td>5.85</td>
<td>58.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ability to verbally express feelings</td>
<td>Ex</td>
<td>10</td>
<td>15.15</td>
<td>151.5</td>
<td>3.5</td>
<td>-3.695</td>
<td>0.01**</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>10</td>
<td>5.85</td>
<td>58.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ability to respond to the speech and questions of others</td>
<td>Ex</td>
<td>10</td>
<td>15.15</td>
<td>151.5</td>
<td>3.5</td>
<td>-3.695</td>
<td>0.01**</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>10</td>
<td>5.85</td>
<td>58.5</td>
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<td></td>
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<tr>
<td>Total</td>
<td>Ex</td>
<td>10</td>
<td>15.15</td>
<td>151.5</td>
<td>3.5</td>
<td>-3.695</td>
<td>0.01**</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>10</td>
<td>5.85</td>
<td>58.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: **P < 0.01
Results indicated increased speaking and questioning skills in correct language, the ability to verbally express things, needs, and desires, the skill of pronouncing and imitating words, letters and sounds, repetition and arranging skill, the ability to verbally express feelings and the ability to respond to the speech and questions of others.

Discussion

This study investigated the effect of a psycholinguistic training to improve expressive language among children with ASD. Results indicated increased speaking and questioning skills in correct language, the ability to verbally express things, needs, and desires, the skill of pronouncing and imitating words, letters and sounds, repetition and arranging skill, the ability to verbally express feelings and the ability to respond to the speech and questions of others. This result goes in the same line with those of Lane, Shepley and Lieberman-Betz (2016) who found that the intervention had positive and maintained effects on trial-based use of language targets, as well as concomitant changes in commenting, requesting, and phrase complexity. This finding aligns with past research examining treatment intensity on communication outcomes for children with disabilities and expressive communication delays (Warren, Fey & Yoder, 2007).

This indicates that it is necessary to pay attention to the development of the various verbal and expressive performance skills of children with ASD and to find a set of verbal language activities that contribute to improving these skills in an interesting and attractive way, taking into account providing the opportunity for children to present their work and talk about it according to their desires. It is crucial to help and encourage them to express their work. Verbal language activities add an atmosphere of familiarity between everyone, normally developed peers and children with ASD. The child in the activity group is seen by his classmates, and he/she in turn can see the group, which develops his/her sense of affiliation.

Conclusion and Recommendations

Overall, results from this study contribute to the growing literature on the effect of a psycholinguistic training to improve expressive
language among children with ASD. The present study lends empirical support to the notion that expressive language of children with ASD can be improved through a psycholinguistic training. Identifying and implementing interventions such as this one used in this study that complement the child’s immediate environment are of paramount importance. Given the importance of indigenous implementers providing interventions in typical settings, such as schools (Division for Early Childhood of the Council for Exceptional Children, 2014), teachers and related staff need feasible interventions for promoting verbalizations in children with ASD.

It is believed that autism results from the child’s lack of understanding and comprehension of verbal language, which results in an imbalance in social relations, but the fact that the lack of understanding of non-verbal language is due to the inability of a child with autism to program verbal and non-verbal language and respond to it appropriate response to the situation in terms of place and time and the environment around it. It may be noted for workers in the field of special education that verbal communication is one of the most important problems that they encounter in the field of caring for autistic children. Verbal communication requires skill in receiving and sending, which is what children with autism lack.

The child ASD has a decrease in linguistic competence in general and verbal in particular, which causes a barrier between the child and the surrounding world, and he loses the window of sight on the world around him. This leads him to show an internal feeling of insecurity; because he is exposed to social situations, for which he is unable to face successfully. Therefore, psycholinguistic training, which include expressive language, and non-verbal communication skills, which are required to participate in social interaction, and communication in social situations, require interactive language activities that motivate the child and develop his skills.

Acknowledgements. The author wishes to thank the children for their participation.
ADHERENCE TO ETHICAL STANDARDS

**Ethics Declarations.** The study was conducted according to the guidelines of the Declaration of Helsinki (1964).

**Data Availability Statement.** The empirical results of research were presented in the repository “Mendeley Data”: https://doi.org/10.17632/9d7t6rmmrw.v1

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**Conflict of Interest.** The author declares no conflict of interest.

**Author Contribution.** The author is the only person that contributed to all parts of this paper.

**Consent for Publication.** The author approves of this submission and, conditional upon the decision made by the editorial board from the peer-review process, consent to the publication of the current work. The work has not been submitted to other journals in consideration for publication.

**References**


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АНОТАЦІЯ
Мета. Дослідити вплив психолінгвістичного тренінгу на розвиток експресивного мовлення у дітей з РАС.
Методи. Дані були зібрані у дітей протягом 2021–2022 навчального року. У дослідженні взяли участь 20 дітей з РАС віком від 7 до 10 років, які навчалися у школі для дітей з порушенням інтелекту. Всі діти відвідували один семестр у школі. Директор і шкільний психолог розіслали батькам передбачуваних учасників форми батьківської згоди, щоб проінформувати їх про дослідження і попросити дати дозвіл на участь своїх дітей у дослідженні. Демографічна інформація була отримана зі шкільної документації та зі слів батьків. Діти були розподілені випадковим чином на дві групи: експериментальну (n=10) та контрольну (n=10). Ці діти були підібрані як група з кейсами на основі віку, IQ, соціального статусу та загального рівня мовленнєвих здібностей. Спеціально для цього дослідження був розроблений шестивимірний опитувальник з 24 пунктів. Метою опитувального було виявити експресивні мовленнєві навички дітей з РАС за шістьма вимірами: вміння правильно говорити та ставити запитання (4 пункти), вміння вірбально виражати думки, потреби та бажання (4 пункти), вміння вимовляти та імітувати слова, букв та звуки (4 пункти), вміння повторювати та вибудовувати висловлювання (4 пункти), вміння вірбально виражати почаття (4 пункти), вміння реагувати на мовлення та запитання оточуючих людей.
Результати. Результати свідчать про покращення навичок говоріння та ставити запитання правильною мовою, вміння вірбально виражати думки, потреби та бажання, вміння вимовляти та імітувати слова, букв та звуки, навички повторення та побудови висловлювання, вміння вірбально виражати почаття та вміння реагувати на мовлення та запитання інших людей.
Висновки. В цілому, результати цього дослідження сприяють збагаченню літератури про вплив психолінгвістичного тренінгу на покращення експресивного мовлення дітей з РАС. Здійснене дослідження надає емпірічну підтримку ідеї про те, що експресивне мовлення дітей з РАС може бути покращене за допомогою психолінгвістичного тренінгу.
Ключові слова: психолінгвістичний тренінг, експресивне мовлення, діти з РАС, імітаційні слова.