

Investigating Impairments in Persian-Speaking Autistic Children in Understanding and Expressing Two-Part Combinations

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Abstract

The present study aims to investigate the level of impairment in Persian-speaking autistic children in understanding and expressing two-part combinations. This research was conducted as a quasi-experimental study with a control group design. The statistical population included 3-to-7-year-old children with autism spectrum disorder (ASD¹) and typically developing preschool children. The autistic children participating in this study were enrolled in educational and rehabilitation centers in 2023, Tabriz. The sample was randomly selected from children learning in rehabilitation centers, kindergartens, and regular schools in Tabriz. All eligible and accessible individuals were included in the study. Bilingual children in this study were defined as those whose native language was Azerbaijani Turkish, while they received formal education in Persian-language schools. A total of 81 children participated, of whom 40 were autistic, and 41 were typically developing. The BAT test was used to examine the understanding and expression of grammatical structures in Persian among autistic children and their typically developing peers. Children's responses were recorded on the TROG test questionnaire and analyzed using SPSS software.

The results showed that the mean score of impairment in understanding and expressing two-part combinations in Persian-speaking autistic children was 0/92, with a standard deviation of 0/91 and a skewness of 0/99. This indicates a very high level of impairment. The level of impairment in understanding and expressing negative sentences, reversible active sentences, and singular/plural noun inflection in Persian was within the range of 0 to 1, indicating a very high level of impairment. Similarly, the level of impairment in understanding and expressing "not only X but also Y" structures in Persian was within the same range, confirming a very high level of impairment.

Key words: Autism, Children's Impairment, Understanding and Expressing Negative Sentences, Reversible Active Sentences, Noun Inflection, Morphosyntactic.

Introduction

Parenthood can change one's life in an instant. The moment a child is born or welcomed into the family through adoption is often filled with hope, excitement, and dreams for a bright and fulfilling future. During the early years,

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while parents enjoy their child's innocent behaviors, subtle signs may begin to emerge that suggest their development might be different from typical expectations. Gradually, the mental image of a conventional future may begin to fade. Eventually, the diagnosis of autism spectrum disorder (ASD) is introduced often accompanied by implicit or explicit messages implying that the child may never lead a "normal" or meaningful life. These pessimistic forecasts, though sometimes unintentionally delivered, can deeply affect the emotional world of parents. As Kate .C Walde(2019) notes, such projections, frequently coming from confident professionals, may convey a strong sense of limitation regarding the child's potential, reinforcing fears about the child, the parent's own capabilities, and the future itself.

Autism is a neurological disorder that disrupts the brain's ability to process information effectively, leading to difficulties in social interaction and communication. According to Yule (2006), the identification of brain lesions in individuals with specific speech disorders has clarified the role of certain brain areas in normal speech abilities. Numerous studies have been conducted on various parts of the brain related to language functions. Damage to the Broca's area causes issues in speech production, while damage to Wernicke's area results in difficulties in speech comprehension. Since both areas are located in the brain's left hemisphere and damage to their counterparts in the right hemisphere does not

cause similar issues, it is inferred that language processing is predominantly a left-hemisphere function.

Some experimental evidence suggests that the left hemisphere is impaired in individuals with autism, which contributes to language delays or deficits (Lyons, 2004). **Aphasia** refers to the impairment in expressing or understanding language due to brain damage. Wernicke's aphasia, which affects the semantic aspect of language, contrasts with Broca's aphasia, which involves difficulties in speech production. In Wernicke's aphasia, patients may experience challenges in understanding speech and producing meaningful utterances, even though their speech might seem fluent but lacks coherence.

Agrammatism is a specific speech disorder characterized by difficulties in constructing grammatically correct sentences due to brain damage. This impairment can affect both speech and writing (NiliPour et al., 2013). It is often associated with Broca's aphasia, resulting in non-fluent speech and a restricted use of grammatical words, such as articles, prepositions, and auxiliary verbs. Meanwhile, content words like nouns and verbs are less impacted. Agrammatism poses challenges in constructing complex sentences, as described by Miceli et al. (1983) and Kolk (2010).

A primary cognitive feature of autism is difficulty in understanding others' mental states, a concept linked to the theory of mind. Children with autism struggle to comprehend that others might have different thoughts, beliefs, or desires. For instance,

a child who points to a picture in a book and asks about it without showing the picture assumes that the other person sees it as well. This lack of understanding of others' mental states develops more slowly in autistic children.

Maleki Shah Mahmoud et al. (2008) indicated that Specific Language Impairment (SLI), a type of language disorder with no identifiable cause, is traditionally defined by excluding other potential factors. In their study, no significant differences were observed in the use of different types of words and morphemes between children with SLI and a control group. Similarly, Roohparvar et al. (2014) described autism as a neurodevelopmental disorder characterized by difficulties in social interaction, communication, and repetitive behaviors. Children with autism showed limited interest in communication, prompting educators to record 30 minutes of their verbal interactions for analysis. Morphosyntactic features such as tense accuracy, subject-verb agreement, use of prepositions, negation, noun pluralization, and use of demonstratives and compound sentences were extracted for study.

Autistic individuals often face challenges in understanding and interpreting body language, partly due to poor eye contact, which hinders their ability to recognize nonverbal cues (Farahani, 2017). Unfortunately, limited research has been conducted in Iran on the grammatical difficulties of children with autism compared to other countries. Among the various linguistic impairments observed in these children,

challenges in understanding and using grammar are particularly significant.

Grammar encompasses the rules governing the structure of words, sentences, phonemes, sounds, and meanings in a language. In Persian, grammar refers to the rules that native speakers use in their spoken and written communication. Traditional Persian grammarians define grammar as the art of correct speaking, writing, and language instruction, dividing it into two main branches: morphology (word study) and syntax (sentence study). Based on these considerations, this study aims to investigate the extent of impairment in understanding and expressing two-part combinations in Persian-speaking children with autism.

Theoretical Foundations of Research

Language Problems in Children with Autism

Individuals with Autism Spectrum Disorder (ASD) exhibit significant impairments in both verbal and non-verbal social interactions. For instance, they often struggle to establish relationships with peers appropriate to their developmental level. They lack spontaneous efforts to share joy, interests, or achievements with others (e.g., they do not show objects of interest, bring them to others, or point at them). These individuals face challenges in emotional or social interactions, flap their hands when excited, resist being hugged or held, fail to use gestures like pointing to share interests, and do not follow others' gaze when they point at something.

Moreover, individuals with ASD experience deficiencies in communication skills (speech and

language). For example, their language development may be delayed or entirely absent. Among those who do speak, there are noticeable difficulties in initiating conversations and maintaining them. Their speech is often stereotypical and repetitive, and they might use idiosyncratic language. They face challenges in expressing their needs and desires, misuse pronouns, fail to follow instructions, and do not respond to being called (appearing as though they are deaf). They also struggle to understand or correctly interpret idioms, metaphors, and expressions. Their speech may be abnormal, for example, robotic in tone (Sobhani Rad, 2013).

Symptoms of Autism Spectrum Disorder (ASD) typically manifest before the age of five. These symptoms may include delayed speech development or complete mutism, monotonous or repetitive speech patterns, limited use of simple sentences or phrases, and resistance to affectionate physical contact from family members.

Children with autism may exhibit intense emotional reactions such as anger or sadness in response to simple requests. They often demonstrate reduced social awareness but show heightened sensitivity to violations of their personal space. A lack of interest in playing with peers, indifference to social situations, failure to respond to face-to-face interaction, and avoidance of direct eye contact are also commonly observed. Other features include repetitive behaviors (such as hand or body flapping), repetitive object play

(e.g., arranging blocks by color or size), strong adherence to routines with resistance to change, unusual sensory preferences, and tendencies to sniff objects or people (Holtrop, 2019).

Significant individual differences in language development are observed among individuals with autism. Some never develop speech, while others, despite having fluent speech, encounter difficulties in understanding and using language. Due to the diversity of individual differences and severity of the disorder, the spectrum of disabilities ranges from mild to severe autism. One of the primary differences between these two extremes lies in the linguistic abilities of individuals. Those with severe autism may be mute or acquire minimal speech characterized by echolalia. Those with mild autism develop language but use words and phrases based on their own understanding and face challenges in conversations. Additionally, syntactic errors are observed in their speech (Roohparvar, 2014).

Language in Children with Autism

Given that language problems are a critical diagnostic criterion for autism, regardless of the theoretical perspective or causal explanation, language-related issues are a crucial descriptor of ASD. It is widely agreed that any proposed intervention should be as detailed and individualized as possible, based on the communication and language profile of the individual (Bartolucci, 1976). Some researchers argue that many behavioral abnormalities observed in autism, particularly difficulties with socialization and communication, are related to deficits in the

theory of mind (Reindal, 2021).

ASD is a type of neurodevelopmental disorder characterized by delays or abnormal functioning in one or more areas, including social interaction, verbal communication, and symbolic play, accompanied by a restricted and repetitive range of interests, behaviors, and activities (Miller, 2006). The prevalence of autism in Iran in 2014 was reported as 2.95 per 10,000 children (Matson, 2010).

Children with ASD often show associated disorders, including intellectual and learning disabilities. However, some have average or above-average IQs and exhibit fluent speech with deviations in pragmatic language skills. These children are often referred to as individuals with high-functioning autism (Sanders, 2009). In some cases, syntactic language impairments have also been reported, though these are not considered primary impairments in such children (Roohparvar et al., 2014; Robins, 2004).

Deficits in theory of mind skills are frequently reported in children with autism. Theoretically, these deficits are even considered a foundational cause of social deficits in these children (Janke, 2017). Numerous studies have shown that individuals with autism struggle with understanding false beliefs held by others (Hansson, 2002; Dang, 2014).

Language and Grammar Patterns in Children with Autism

Delayed language development is one of the first signs of ASD, often considered during diagnosis.

Compared to behavioral and social deficits, the language impairment of these children has received less attention. Previous studies have shown that these children struggle with language comprehension. Considering the importance of language comprehension in their developmental and academic skills, understanding the type and origin of their comprehension problems is crucial (Ahadi, 2015).

Identifying the language profile of children with autism can help address questions about areas requiring further investigation. Some researchers argue that language impairments are related to one of the three language components—form, function, and meaning—or their interplay. However, Walenski et al. (2006) suggest that the language profile of individuals with autism consists of pragmatic and syntactic impairments but relatively intact lexical abilities.

Many authors consider pragmatic impairments to be the hallmark of autism. Since the 1980s, researchers have extensively studied pragmatic difficulties in these children. However, from the early 21st century, more attention has been given to formal and semantic aspects. Vocabulary and syntax are closely related in the speech of typically developing children, such that the weakness or strength of one affects the other. For example, many studies have shown that children comprehend abstract vocabulary based on sentence syntax, a process known as syntactic bootstrapping. However, how children with ASD use lexical information to understand sentences

remains unclear. One way to understand the role of lexical knowledge in the language development of these children is to examine their comprehension of sentences that require different levels of lexical and syntactic knowledge for understanding (Ahadi, 2015).

Language and Theory of Mind in Children with Autism

Children with autism may suffer from various language disorders, including issues in the areas of pragmatics, syntax, and semantics. Some studies emphasize the preservation of vocabulary, grammatical knowledge, and productive skills. The prognosis for autism spectrum disorder is often poor due to the behavioral challenges that make assessment and intervention difficult (Sobhani Rad et al., 2013).

A topic of interest today is the relationship between theory of mind and language, specifically identifying which aspects of language are most impacted by this relationship. Several studies have explored this connection (Roberts, 2004). The speech of children with autism is often highly formal and rigid. They struggle with understanding jokes, irony, and metaphors, interpreting words literally, and comprehending indirect speech acts. This suggests that deficits in theory of mind result in impairments in the pragmatic aspects of language (Ahadi, 2017).

Developmental Language Disorder (DLD¹), also referred to in the literature as Specific Language

Impairment (SLI²) or Primary Language Impairment (PLI³), is characterized by delays in acquiring linguistic skills despite normal cognitive, social, emotional, and auditory functioning. This term applies to children who exhibit significant deficits in language learning that are not compensated for by the age of five (Khetrapal et al., 2017). DLD is a highly prevalent disorder, with an estimated average of two children in every classroom affected by it (Henry, 2020). The most prominent language difficulties in these children are often in the domain of syntax, while their pragmatic skills are generally intact (Friedman, 2006).

Firth and colleagues (1988) examined the role of various aspects of language (including overall grammar scores, tense markers, syntactic complements, and vocabulary scores) in the development of theory of mind among 34 children aged 3-5 years with DLD. They concluded that both overall grammatical and lexical skills independently contribute to the development of theory of mind concepts. Furthermore, the facilitative effect of language is not solely tied to syntax but is also significantly associated with overall language development.

Calder (2023) investigated the relationship between complex syntactic language and theory of mind in children with autism and children with learning disabilities. Their findings revealed a stronger correlation between syntactic language and false belief tasks in children with autism,

¹ Developmental Language Disorder

² Specific Language Impairment

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³ Primary Language Impairment

suggesting that syntax predicts performance in theory of mind tasks.

Chang (2006), studying children with autism, Asperger syndrome, and neurotypical development using standardized language tests and false belief tasks, found that syntax is the strongest predictor of theory of mind across all three groups. However, few studies have explored theory of mind in Persian-speaking children with autism, and none have addressed the relationship between language and theory of mind.

Biran and colleagues (2005) compared factors influencing the development of theory of mind levels in children with autism and typically developing children. Their results showed that children with autism exhibit significant deficits in the development of various levels of theory of mind compared to typically developing children. However, age does not significantly affect their test results, while IQ and gender have a meaningful impact on theory of mind development.

Researchers such as Bishop et al. (2017) have suggested that the relationship between language skills and theory of mind in late preschool is largely dependent on the development of vocabulary skills.

Nevertheless, Durrleman and colleagues (2019) investigated the efficacy of syntactic (focusing on complement clauses) and lexical language interventions in improving false belief understanding in children with DLD. Their study showed that while syntactic interventions focusing

on complement clauses can indirectly enhance theory of mind performance by improving the comprehension and use of these structures, lexical interventions do not produce similar effects (Asberg et al., 2010).

Research Methodology

This study utilized a quasi-experimental design with a control group. The research population included 3-7-year-old children with autism spectrum disorder (ASD) and typically developing preschool children. Children with autism participating in this study were enrolled in rehabilitation and educational centers in Tabriz and were receiving rehabilitation services. The diagnosis of ASD was made based on standard criteria by specialist psychiatrists. The control group consisted of typically developing preschool children attending regular schools and served as age-matched peers for comparison.

The sample for this study included children aged 3 to 7 years with autism and their typically developing peers. Random sampling was conducted from children attending rehabilitation centers, kindergartens, and regular schools in Tabriz. All eligible individuals meeting the inclusion criteria were studied. A total of 81 participants were selected, comprising 40 autistic children and 41 typically developing children (children with autism who did not cooperate during the study were excluded).

Inclusion criteria for intervention and control groups:

- Diagnosis of ASD using the Autism Screening Form and confirmed by a child psychiatrist.
- Chronological age between 3 and 7 years (36 to 84 months).
- No comorbid psychological or psychiatric disorders except autism and intellectual disabilities.
- Low-functioning or non-verbal autism spectrum disorder.

Exclusion criteria:

- Receiving rehabilitation interventions and Persian language training during the intervention.
- Failing to meet inclusion criteria.
- Having speech ability or a vocabulary exceeding four words.
- Not receiving Persian language education.

To assess the comprehension and production of Persian syntactic structures among children with autism and their typically developing peers, the BAT test was used. Children's responses were recorded on the TROG test questionnaire and analyzed using SPSS software.

This research is registered under the ethical approval code **IR.IAU.TABRIZ.REC.1401.267**.

Findings

Age Distribution of Children with Autism

Table 1 shows the average age of children with

autism as 5/91 years, with a standard deviation of 1/36 and a skewness of -1/006. The minimum age is 3 years, and the maximum is 7 years.

Table 1. Age distribution of children with autism.

Variable	Count	Mean	Standard Deviation	Skewness	Min	Max
Children's Age	40	5/91	1/36	-1/006	3	7

Autism-Related Impairments in Language Components

Understanding and Expressing Two-Element Combinations in Persian

Table 2 indicates that the average impairment score for understanding and expressing two-element combinations in Persian is 0/92, with a standard deviation of 0/91 and skewness of 0/99. The scores range from 0 to 4. The mean score falls between 0 and 1, highlighting a high level of impairment.

Table 2: Distribution of the Severity of Impairment in Comprehension and Expression of Two Components (Elements) in Persian in Children with Autism.

Variable	Count	Mean	Standard Deviation	Skewness	Min	Max
Impairment in Two-Element Combination	40	0/92	0/91	0/99	0	4

Understanding and Expressing Negative Sentences in Persian

Table 3 shows an average impairment score of 0/8, a standard deviation of 0/96, and skewness of 1/5. Scores range between 0 and 4, with the mean value confirming a high level of impairment.

Table 3: Distribution of the Severity of Impairment in Comprehension and Expression of Negative Sentences in Persian in Children with Autism.

Variable	Count	Mean	Standard Deviation	Skewness	Min	Max
Impairment in Negative Sentences	40	0/8	0/96	1/5	0	4

Understanding and Expressing Reversible Active Sentences in Persian

According to Table 4, the average impairment score for reversible active sentences is 0/6, with a standard deviation of 0/77 and skewness of 1/19. Scores range between 0 and 3, indicating a high level of impairment.

Table 4: Distribution of the Severity of Impairment in Comprehension and Expression of Reversible Active Sentences in Persian in Children with Autism.

Variable	Count	Mean	Standard Deviation	Skewness	Min	Max
Impairment in Reversible	40	0/6	0/77	1/19	0	3

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Morphological Inflection of Singular/Plural Nouns in Persian

Table 5 reveals an average impairment score of 0/5, a standard deviation of 0/81, and skewness of 1/48. The scores range from 0 to 3, demonstrating a significant impairment.

Table 5: Distribution of the Severity of Impairment in the Inflection of Singular/Plural Nouns in Persian in Children with Autism.

Variable	Count	Mean	Standard Deviation	Skewness	Min	Max
Impairment in Singular/Plural Inflection	40	0/5	0/81	1/48	0	3

Understanding and Expressing “Not Only X but Also Y” Structures in Persian

Table 6 shows an average impairment score of 0/77, a standard deviation of 0/76, and skewness of 0/77. The scores range between 0 and 3, signifying a considerable level of impairment.

Table 6: Distribution of the Severity of Impairment in Comprehension and Expression of “Not Only X but Also Y” in Persian in Children with Autism.

Variable	Count	Mean	Standard	Skewness	Min	Max
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Impairment in "Not Only X but Also Y" Structures	40	0/77	0/76	0/77	0	3

Conclusion

The study aimed to evaluate the level of impairment in understanding and expressing various linguistic structures in Persian among children with autism. Findings indicate significant impairments across all examined aspects, including:

- Two-element combinations,
- Negative sentences,
- Reversible sentences (active and passive),
- Singular/plural inflection,
- "Not only X but also Y" structures.

The results align with prior studies, such as those by Biran (2007) and Nolan et al. (2014), which highlighted pronounced challenges in understanding and expressing negative and reversible sentences. However, discrepancies were observed, particularly in impairments related to two-element combinations, which some earlier research found less problematic. These differences may stem from variations in sampling, assessment tools, or contextual factors such as educational and therapeutic approaches.

Recommendations

1. Educational Programs:

- Develop specialized programs targeting language and grammar skills through interactive activities and language games.

2. Training for Parents and Teachers:

- Conduct workshops to enhance understanding of autistic children's language needs and effective strategies to assist them.

3. Policy Implications:

- Use findings to guide policymakers in designing inclusive and targeted educational frameworks.

4. Therapeutic Applications:

- Develop speech therapy interventions incorporating technology and interactive exercises to strengthen language abilities.

The study's small sample size limits the generalizability of results. Future research with larger samples can provide a more comprehensive understanding of language impairments in children with autism.

References

- Albert, M. L., & Sandson, J. (1986). Perseveration in aphasia. *Cortex*, 22(1), 103–115. [https://doi.org/10.1016/S0010-9452\(86\)80035-1](https://doi.org/10.1016/S0010-9452(86)80035-1)
- Asberg, J. (2010). Patterns of language and discourse comprehension skills in school-aged children with autism spectrum disorders. *Scandinavian Journal of Psychology*, 51(6), 534–539.
- Bartolucci, G. (Ed.). (1976). Formal aspects of language in childhood autism. *Autism and Severe Psychopathology: Advances in Child Behavior Analysis and Therapy*. Lexington, MA: Lexington

Books.

- Biran, M., & Friedmann, N. (2005). From phonological paraphasias to the structure of the phonological output lexicon. **Language and Cognitive Processes**, 20(5), 589–616. doi: 10.1080/01690960400005813.
- Biran, M., & Friedmann, N. (2007). **MA KASHUR: Picture Associations Test**. Tel Aviv: Tel Aviv University.
- Bishop, D. V. M., Snowling, M. J., Thompson, P. A., & Greenhalgh, T. (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *Journal of Child Psychology and Psychiatry*, 10, 1068–1080.
- Boucher J, Russell J. Language profiles in children with autism. theoretical and methodological implications. *Autism* 1997;1(1):57-54.
- Calder, S. D., Visentin, D., Claessen, M., Hollingsworth, L., Ebbels, S., Smith-Lock, K., & Leitão, S. (2023). The grammaticality judgement of inflectional morphology in children with and without developmental language disorder. *Clinical Linguistics & Phonetics*. <https://doi.org/10.1080/02699206.2023.2236768>
- Dang, S. L., Chang, Y. H., Chan, H. K., Wong, P. K., & Hong, P. M. (2014). A comparative study of modern Chinese and Cantonese in the development of teaching resources. Department of Chinese Language and Literature, The Chinese University of Hong Kong.
- Firth, U. & Leslie, A. (1988). Autistic children's understanding of seeing, knowing and believing.

British Journal of Developmental Psychology, 4, 315-324.

Freidman, N., and Lavi, H. (2006). "On the order of acquisition of Amovement, WH-movement and V-C movement," in *language acquisition and [Development*, eds A. Belletti, E. Bennati, C. chesi, E. Di Domenico, and J. Ferrari (Newcastle: Cambridge Scholar press), 211-217.

Hansson K, Nettelbladt U. Assessment of Specific Language Impairment in Swedish. The Department of Legaoedied and Phoniatics. *Log phon Vocol* 2002;146-154.

Holtrop, M. (2019). *Understanding autism: Scientific evidence, natural strategies and practical steps to achieve a healthy and thriving life* (A. Firouzi, Trans.) Karaj: Simorgh-e Aseman-e Azargan Publishing.

Henry, L. A., & Solari, E. J. (2020). Differences in complex sentence comprehension in children with autism spectrum disorder and language impairment. *Journal of Speech, Language, and Hearing Research*, 63(2), 488-500.

Janke, V., & Perovic, A. (2017). Contrasting complement control, temporal adjunct control, and controlled verbal gerund subjects in ASD: The role of contextual cues in reference assignment. *Frontiers in Psychology*, 8, Article 448. <https://doi.org/10.3389/fpsyg.2017.00448>

Khetrapal, N., & Thornton, R. (2017). C-command in the grammar of children with high-functioning autism. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.00448>

Kolk, H. (2010). "Agrammatism I", *Brain and Language Encyclopedia*, Elsevier Ltd.

- Lyons, V., & Fitzgerald, M. (2004). Humor in autism and Asperger syndrome. *Journal of Autism and Developmental Disorders*, 34(5), 521–531.
- Miceli, G., Mazzuchi, A., Menn, L., & Goodglass, H. (1983). Contrasting cases of Italian agrammatic aphasia without comprehension disorder. *Brain and Language*, 35(1), 24–65.
- Matson, J. L., Mahan, S., Kozlowski, A. M., & Shoemaker, M. D. P. (2010). Developmental milestones in toddlers with autistic disorder, pervasive developmental disorder—not otherwise specified, and atypical development. *Developmental Neurorehabilitation*, 13(4), 239–247.
- Nili Pour, R., et al. (2013). Descriptive dictionary of speech and language pathology. Tehran: Moaser Culture Publishing.
- Nolen-Hoeksema, S. (2014). Neurodevelopmental and neurocognitive disorders. In *Abnormal psychology* (6th ed.). New York: McGraw-Hill.
- Reindal, L., Nærlund, T., Weidle, B., Lydersen, S., Andreassen, O. A., & Sund, A. M. (2021). Structural and pragmatic language impairments in children evaluated for autism spectrum disorder (ASD). *Journal of Autism and Developmental Disorders*, 53(2), 701–719.
- Roberts, J. A., Rice, M. L., & Tager-Flusberg, H. (2004). Tense marking in children with autism. *Applied Psycholinguistics*, 25(3), 429–448.
- Robins, D. L., Fein, D., Barton, M. L., & Green, J. A. (2004). The Modified Checklist for Autism in Toddlers: An initial study investigating the early detection of autism and pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 34(2), 131–144.
- Roohparvar R, Karami M, Madadi M. Comparing phonetic, phonologic, morphologic and syntactic features of speech in children with autism and typically developing children. *mrj* 2014; 8 (3) :62-68
- Sobhani Rad, D., Moghimi, A., Ghanaei Chaman Abad, A., & Maroozi, P. (2013). A study and comparison of the linguistic features of autistic children. *Clinical Psychology and Counseling Research*. <https://doi.org/10.22067/ijap.v3i1.9445>
- Walneski, M., et al. (2006). *Language in autism*. London: Taylor & Francis Books.
- Wilde, K.C. (2019). *The Autism language launcher: A parent's guide to Helping Your Child Turn Sounds and Words into Simple Conversations*. (A. Firouzi & A. Rezaei, Trans.) Tehran: Arshadan Publishing.
- Yule, G. (2006). *The study of language* (A. Bahrami, Trans.). Tehran: Rahnama. (Original work published 1996)