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An Investigation of Language Impairment in Persian-Speaking Autistic Children

Shahram JamaliNesari (Corresponding author)
Islamic Azad University, Eyvan-e-Gharb Branch, Iran
E-mail: shahramjamali@yahoo.com

Elahe Kamari
Department of Linguistics, Faculty of Persian Literature and Foreign Languages, Allame Tabataba'i University, Tehran, Iran
E-mail: elahe.kamari4@gmail.com

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Abstract

Abnormalities of language and other forms of communication are among the significant characteristics of autistic children. The goal of the present research is to investigate and compare linguistic properties of Persian-speaking autistic children with their normal counterparts. To this aim, 10 autistic children with age 3-6 years were compared with 10 typically developing children matched on non-verbal IQ and gender. In a 30 minutes free-play session, the speech of each child was recorded and then was analyzed for the phonetic, phonological and morpho-syntactic properties. The findings of the present research showed that there was a statistically significant difference between autistic and normal children in consonant deletion, consonant substitution, the use of stress on inappropriate syllable, atypical intonation, incorrect use of grammatical tense, incorrect use of preposition, inappropriate use of plural nouns and the use of complex sentences ($p<0/05$), While their differences were not statistically significant in sound epenthesis, metathesis, subject-verb agreement, having difficulty with making the verbs negative, and using demonstratives ($p>0/05$). The results of this research showed that autistic children in compare to normal ones have more problems in phonetic, phonological, morphological and syntactic features of speech. Therefore, appropriate treatment programs are required to tackle these problems.

Keywords: Autistic children, normal children, Persian-speaking children, linguistic properties

1. Introduction

Pervasive Developmental Disorder refers to a group of disorders in which the development of social skills, language, and communication are delayed and deviant (Lindgren et al., 2009; Noens & van Berckelaer-Onnes, 2005; Whitehouse et al., 2009; Tager-Flusberg, 1999; Oram Cary et al., 2005). Among these disorders, Autism which occurs prior to age of three has been more of interest to researchers. (Zwaigenbaum, 2001; Tager-Flusberg et al., 2009). Autism is a neurodevelopmental disorder which its effects are evident in social, communicative and behavioral areas (That et al., 2007). Symptoms of this disorder are as follow: bilateral abnormal social interaction, delayed communication skills and limited activities and individual interests (Zwaigenbaum, 2001; That et al., 2007; Kjelgaard & Tager-Flusberg, 2001; Sadock & Sadock, 2003). A communicative disorder in these patients varies from absolute silence to enough speech but with poor communication skills. Many of these children are diagnosed with this disorder, when they are referred for evaluation by their parents because of a delay that takes place in language acquisition (Hoof, 2009). An attainment of these stages in language learning seems to be strongly related to long-term-prognosis (Szatmari et al., 2003).

This disorder has a significant effect on the development of spoken language and communication. Four main areas are investigated in studies describing language in patients with autism: a) lack of verbal ability (inability to acquire spoken language) which occurs in 50-75% of people with autism), b) early disorders that are related to the impairment in words which are produced by normal children in 12-18 months but in autistic children are produced in 35 months for the first time (Rapin, 1991).This types of language delay is one of the diagnosis criteria in autism, c) atypical features of language productions such as echolalia and jargon and d) impairment of higher discourse and pragmatic levels (Lord & Paul, 1997).

Echolalia which includes immediate, delayed echoing or repetition of whole utterance and conversations without analyzing them, occurs also in normal children. However, echolalia in autistic children is longer and more intense. In fact, much of verbal productions in autistic children are echolalic. Although there is no agreement on the functions of echolalia, but it can be said that one of its main objectives is communicative. For example, children may echo others speech in conversation when they are unsure of their response or when they attempt to hold information in their

memory (Prizant & Duchan, 1981).

The use of jargon or nonsense words in children with autism has been frequently reported. Children with autism may use unusual and inappropriate labels to name objects. They may invent nonsense terms with inconsistent meanings and link phrases with unusual meanings. Production of jargon like that of echolalia may serve several functions. For example, it may indicate the inability of autistic person to update their mental representations or it may be used as a bridge when they are unsure of their own responses in a conversation (Lord & Paul, 1997).

In addition to echolalia and jargon, individuals with autism spectrum disorder have a unique speech style which is characterized by specific suprasegmental properties such as unusually soft or often loud, speech volume; flat or singsong intonation; hoarseness; hyper-nasality and unusually fast or low speech rates (Shriberg et al., 2001). Their speech usually contains very formal and precise words, neologism and strange phrases (Lord & Paul, 1997).

Research also showed that pragmatic language use-the use of language as a social system to communicate is severely impaired in individuals with autism. The problems of these individuals in high level discourse include difficulty with turn-taking, literal interpretation of sentence meanings (these patients respond to the literal meaning of the metaphors and do not understand the underlying meaning of irony and sarcasm). Their responses in conversations ignore the Gricean maxims of quality, quantity, relevance and manner; (Grice, 1975) and they have difficulty in structuring narratives (Capps et al., 2000; Diehl et al., 2006) The possibility of using words that are inappropriate in terms of formality level (i.e., register) leads to pedantic, precise speech (Lord & Pickles, 1996).

Learning the grammatical structure of a language-learning to combine words into phrases; learning grammatical categories (e.g., noun, verb, object, agent) (Brown, 1973) and learning to use grammatical elements of language (e.g., morphemes such as –ing, -ed, or cat, which are words or part of words that carry grammatical meaning) (Fein & Waterhouse, 1979) are also impaired.

While extensive literature examined different aspects of language in autistic children, there has not been an extensive research about linguistic characteristics of Farsi-Speaking autistic children. Among these research Lewis et al. (2007) showed that there are significant differences between the linguistic abilities of autistic children and their age-matched normal children. The results of the study of Kjelgaard & Tager-Flusberg (2001) indicated that children with autism are heterogeneous with respect to their linguistic abilities. Based on their results about 1/4 of these children showed no grammatical impairment in their speech while 3/4 others showed various grammatical impairment. They also showed that some children have difficulty in the production of multi-syllable compounds as well as in the production of consonants.

Comparison of autistic and normal children on their ability to produce accent in repetition of nonsense syllable indicated a significant difference between these two groups. Baltax (1984) investigated the speech of autistic children and found that these children accent the inappropriate syllable more than normal children do. Bartolucci et al. (1976) investigated the phonological errors in 9 autistic children in compare to normal counterparts. Although there was a kind of uniformity in the acquisition of phonology in both groups, but there was a delay in phonemic acquisition in autistic children. Phonological investigation of four siblings in a unique family showed that these autistic children, at least the more severely impaired ones, do not only exhibit delayed phonological behavior, but also show some atypical patterns that rarely occur in normal development. Findings from this study reveal five general patterns of phonological behavior, namely: (a) evidence of several phonological processing that are common in normal development; (b) persistence of several phonological processes, such as labialization, cluster reduction, or final consonant deletion, beyond the expected age; (c) evidence of unusual sound changes, such as extensive segment coalescence, frication of liquids, and velarization; (d) evidence of "chronological mismatch" (Grunwell, 1981), which is the absence of earlier sounds co-occurring with characteristics of later development; and (e) restricted use of contrasts. These findings support earlier work on a single autistic child using phonological investigations (Wolk & Edwards, 1993), but contrast with all previous research suggesting that autistic children exhibit delayed rather than unusual phonological development. According to Rupin & Dunn (2003) preschoolers language deficits parallel those of non-autistic preschoolers with developmental language disorders. They also indicated that preschoolers have linguistic deficits which involve reception and production of phonology (sounds of speech) and syntax (grammar). Bartolucci et al. (1980) found that deletion of specific elements such as articles "a" and "the", auxiliary and linking verbs, past tense morphemes, third person singular tens, and progressive present tense is more probable among autistic children than normal children. According to Tagr-Flusberg (2003) the use of past tense verbs in the speech productions of children with autism was significantly lower in compare to normal children.

To date, no comprehensive research has been done on the linguistic features of Farsi-speaking children with autism. In the present study, phonetic, phonological and morpho-syntactic properties of 10 autistic children are investigated and compared to a group of 10 language-matched typically developing children.

2. Materials and Methods

2.1 Participants

Participants in this study included children in two groups: (a) 10 children with autism age 3-6 years; (b) 10 typically developing children matched on non-verbal IQ and gender. Participant information is presented in table 1. Autism group was verbal and high-functioning with mean non-verbal IQ scores in the low average range. A psychiatrist conducted an interview to confirm the diagnosis of autism using the ADI-R and the ADOS with all children in the autism group. Both ADI-R and the ADOS were scored according to DSM-V and ICD-10 criteria for autism disorder. Only subjects whose

early development and current level of functioning meet strict criteria for diagnosis of autism on both the ADI-R and the ADOS were included (see table 2). Only participants who were able to produce at least 2-word phrases were included; all autistic participants had been talking for at least 12 months at the time of the study and were considered verbal. All participants in this group had significant early language impairments. Typically developing children were recruited from a public kindergarten in Tehran. All parents gave informed consent for their children to participate in the research.

Table 1. Demographic data of Autistic and typically developing groups

N	TD M SD (Range)	Autism M (SD) Range	Group differences
Chronological age*** (mos)	10	10	
Stanford-Binet Nonverbal IQ*** (Scaled Score)	43.2 (11.59) 24-60	55.2 (12.26) 36-72	TD<Aut
Stanford-Binet Nonverbal IQ (Age-equivalent score, months)	100 (8) 81-119	80 (14) 47-105	TD>Aut
Peabody Picture Vocabulary Test (Age-equivalent score, months	43 (5) 33-55	42 (10) 28 (62)	
SES** (Hollingshead 4-factor Index. Lrger numbers indicate higher SES)	48.6 (5.9) 34-60	41.2 (13) 20-68	
	55 (13)	52 (10)	

*** p < .05

Table 1. Autism diagnostic measures (Autism group only)

	ADR-R M (SD) Range	Cut-Offa	ADOS M (SD) Range	Cut-Offa
Communication	151 (4.1) 6-22	7	6.7 (1.3) 5-9	5
Social reciprocity	18.6 (4.8) 10-25	10	10.7 (1.6) 7-15	6
Repetitive behavior/ interests	7.9 (2.5) 3-13	3	1.9 (1.2) 0-5	N/Ab
Differences apparent (mos)c	22.23 (6.7)			
Age at which at least 5 words are used meaningfully (mos)	28.5 (11.5) 10-49			
Time between age of first words and age of assessment (mos)	28.7 (11.3) 4-46			

a) For an autism spectrum diagnosis

b) No cut-off score is used as it is possible to meet criteria for an autism spectrum diagnosis on the ADOS without exhibiting repetitive behaviors or stereotyped interests

c) Average age at which parents became aware that development was proceeding differently. For an autism diagnosis, differences must be apparent prior to age three.

2.2 Matching Procedure

Two groups were matched for their intellectual abilities with Tehran Stanford-Binet Intelligence Scale (TSB-5). The non-verbal reasoning consisted of four subtests: Bead memory, Copying, Quantitative and Pattern Analysis which were used for evaluation of intellectual functioning in young children with the developmental disorders. Also, in order to ensure the similarity of two groups on non-syntactic verbal measures, they were matched on receptive vocabulary by using Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2013). Based on this test, there was no statistical significant difference between two groups (see table 1). According to these matching criteria, two groups should be similar in terms of receptive vocabulary, although they may have reached this level at different ages (e.g., two groups were matched by receptive vocabulary but differed in chronological age). Socio-economic status was assessed with Hollingshead four-factor index in which parental occupation and educational level were used to calculate a

weighted index which ranges from 8 to 66 (Hollingshead,1975).

2.3. Procedure

Each child participated in a 30 minutes free-play session in the second reference to the welfare centers (standardization and diagnostic tests took place in the first session). Children and researcher began to play with standard books and toys in the room. Parents were outside the room while children were engaging in free-play sessions. Typically, it was fun for children to play. All the session was video-taped through a one-way mirror. Although children were more comfortable with their parents, the presence of a partner in the play helps to maintain the consistency of play sessions. The play partner attempted to encourage children to engage in the play but if the child stopped or did not initiated the play; he used some standardized prompts to engage the child. First, play partner commented on child's activities with statements like: "that looks like a big cow." If the child did not respond, a direct question was used like "where did you drive your car?" these two strategies are used alternatively except in case the child began to engage in a potentially harmful action (e.g., climbing up a bookshelf or throwing hard objects). In order to talk to children, play partner showed the child some wordless picture book and encouraged them to describe them. All children engaged in this activity for at least several minutes. Participants were also asked to name animals in the books. All the animals were familiar for children. All free play sessions and picture naming were transcribed from videotape. Then morphosyntactic properties of children's utterances including the use of tense, subject-verb agreement, the use of proposition, verb negation, demonstratives and compound sentences were extracted and analyzed.

3. Results

3.1. Phonological properties of children's speech

Table 1 shows the frequency percent of phonological properties of autistic and normal children. The results indicated a statistical significant difference between the two groups in terms of consonant deletion, consonant substitution, stress placement and intonation ($p<.05$). However, the differences between two groups were not significant in relation to metathesis and epenthesis.

Table 3. Frequency percent and significance of children's errors in the use of phonetic, phonological properties

	Consonant deletion	Epenthesis	Consonant substitution	metathesis	Using stress on inappropriate syllable	Atypical intonation
Autism	91%	16%	96%	26%	81%	56%
Typically developing	56%	6%	26%	11%	0%	6%
P value	.031	.605	.000	.407	.000	.001

3.2. Morphosyntactic properties of children's speech

Table 2 shows the frequency percent of different morphosyntactic properties in children's speech. Based on the results, the difference between two groups of participants was statistically significant in the use of appropriate tense, propositions, plural forms of nouns, and compound sentences ($p<.05$). However, there was no statistical significant difference between two groups in terms of subject-verb agreement, verb negation and in the use of demonstratives.

Table 4. Frequency percent of children's errors in the use of morphosyntactic properties

	Use of tense	Subjct-verb agreement	use of propositions	use of negative verbs	use of plural noun phrases	use of demonstratives	Use of compound sentences
Autism	26%	21%	56%	11%	66%	21%	100%
Typically developing	0%	0%	10%	0%	0%	0%	0%
P value	.047	.106	.006	.488	.009	.107	.000

4. Discussion

There were cases of consonant deletion in the speech of 90% of autistic and 56% of typically developing children. Deletion was taken as dropping of an element. These children sometimes deleted the consonants like /gævæzn/ in which /g/ was deleted at the beginning of the word and it was not substituted by the glottal stop /ʔ/ (The correct production of words are in the left and their deficient production by autistic children are at the right).

/gavazn/ → [ævæzn] /g/ → [Ø]

Sometimes the medial phoneme has deleted, as:

/xe → [xes] /r/ → [Ø]

And in some cases the final phoneme has deleted, like:

/gondʒeʃk] → /k/ → [Ø]

The reason for consonant deletion in both autistic and normal children could be due to the ease of articulation.

In the speech of 1bout 15% of autistic children and 5% of normal children there were cases of epenthesis which is the insertion of an additional phoneme to a word and is of two types: prosthesis and anaptyxis. The former is addition of a sound to the beginning of the word and the latter is the addition of a vowel between two consonants (Crystal, 2003). There appeared a case of anaptyxis in the speech of autistic children:

/gævæzn/ → [ævæzæn] / Ø / → [g]

The reason for sound epenthesis could be due to the difficulty in the production of consonant cluster by autistic children. Therefore, in words such as /xeres/ (bear) they inserted a vowel /e/ between the consonant clusters CC in /rs/.

There were some cases of consonant substitution in the speech of 95% of the autistic children and 25% of the normal children. Substitution involves substituting certain phonemes for others. In the following there is an example of phonemic substitution:

/pælæŋ/ → [bælæŋ] /p/ → [b]

In the above example, /p/ at the beginning of the word is substituted with its voiced counterpart /b/. Often, the reason for substitution is assimilation. Because of assimilation, a consonant becomes more like its nearby consonant by losing some of its phonetic features and instead acquiring the phonetic features of that consonant.

In the speech of 25% of autistic children and 10% of normal children there appeared a metathesis process. Metathesis is the reversal of adjacent elements which occurs at the sound level, but sometimes is seen at the syllabic, word and other linguistic levels (Crystal, 2003). Below is an example of metathesis in the speech of autistic children:

/xers/ → [xesr]

Eighty percent of autistic children did not use stress in the appropriate syllable. Stress is a certain emphasis that may be given to certain syllables in a word, or to certain words in a phrase or sentence (Gholamalizade, 1983). In Persian, the last syllable of di-syllabic nouns is stressed (ibid), but in the speech production of 6 autistic children, the first syllable was stressed such as the following:

/ʃo'tor/ → ['otor]

/sæn'dʒâb/ → [sædʒâb]

The lack of using stress in the appropriate syllable in nouns can indicate that the children cannot recognize the noun.

The intonation in the speech of 55% of autistic children was unmoral. Intonation is a variation in the spoken pitch. Expressing the sounds of some parts of the sentence with lower or higher frequency in compare to other sounds of that part causes the sentence to have a specific intonation which in turn can be used to indicate a range of functions (ibid). There is a rising intonation pattern in Persian interrogative, exclamatory and imperative sentences (ibid). In the present study, 55% of autistic children produced sentences in a monotonic tone. All normal children except one (5%) produced correct sentences based on the intonation pattern of each type. The use of just one and the same intonation pattern in all sentence types in autistic children was due to their inability to distinguish declarative, exclamatory and imperative sentences from each other.

Twenty five percent of autistic children could not use the appropriate form of grammatical tense in the sentences, while all the normal children apply it correctly. In grammar, tense is a category that expresses time reference. Tenses are usually manifested by the use of specific verb forms, particularly in their conjugation patterns. Basic tenses found in many languages include past, present and future (ibid). For example, one of the autistic children produced "ʔu: færdâ bâzi kærd" which means "he played tomorrow" instead of the correct tensed sentence "ʔu: færdâ bâzi xâhæd kærd" which means "he will play tomorrow". Some autistic children could not recognize the grammatical tense and the subject-verb agreement.

Twenty percent of autistic children did not observed the subject-verb agreement; while all the normal children adhered to it. Agreement refers to a kind of relation between linguistic elements according to which the application of a certain

form of a word requires the use of a specific form of another word in the sentence (Crystal, 2003). For example, in the sentence "mænæm ketâb dâr-i" there is no agreement between subject and verb. In Persian, the first person singular pronoun "I" is used with a verb which employed the verbal ending "-am", but in this sentence a different verbal ending is used "-i" which is used for a different person in Persian and do not agree with the subject in the sentence.

There were some cases of echolalia in the answers provided by autistic children. Echolalia occurs in the speech of about 75% of autistic individuals (Prizant, 1983). There are two types of echolalia: immediate echolalia and delayed echolalia. The former involves the repetition of others word or groups of words and the latter is the repetition of phrases after a period of time (Fay & Schuler, 1980). For example, when asked one of the autistic children the question of "ketâb dâr-i?" /do you have book? / He asked "mænæm jetâb dâr-i". This was a case of immediate echolalia.

Fifty five percent of autistic children did not use prepositions or they used them inappropriately. For example instead of telling "ʔæz pelle bâlâ ræft"، they told "pelle bâlâ ræft". An example of incorrect use of prepositions in the sentence was when one of the autistic children produced "ketâb zire mize" but the book was actually on the table. Ten percent of normal children did not use the appropriate prepositions in their productions, but they had no incorrect use of the prepositions. Deletion of prepositions in the speech of both normal and autistic children could be for the sake of clipping the sentences and expressing them in a simple manner.

While all the normal children used negative verb forms correctly, only 10% of autistic children experienced difficulty in the production of negative verbs. Instead of placing the negative prefix "næ-" before the main verb, a child used it on the auxiliary verbs. For example, instead of the correct form "næ-gofte büd" the child produced "gofte næ-büd ". The other example in the speech of autistic children was concerned with the compound verbs. Compound verbs are multi-word compounds that function as single verbs. Compound verbs are constructed of a verb and a non-verbal element, such as a noun, verbal noun, compound noun, adjective, past stem, and preposition (Dabir Moghadam, 2005).In order to produce the negative form of the compound verb, the prefix [ne- næ] is added to the verbal element, such as "bâzi næ - kærdæn ". But one of the autistic children added this prefix to the non-verbal element. In this case, instead of telling "pâ ne-mišæm" the child produced "ne-mipâšæm". The autistic children could not recognize that the negative element should be added to the beginning of the main verb but not to the auxiliary verb.

Sixty five percent of autistic children had problems producing the plural forms of nouns, however, normal children all performed well on this task. Autistic children tend to use the singular forms of the verbs. They used the singular forms for the plural nouns. For example, they used "ketâb" /book/ instead of the correct form "ketâb-hâ" /books/. Those autistic children who used the plural forms of nouns used only the suffix "-ha", and instead of words such as "pærænde-gân", "sæbzi-jât" they used "pærænde-hâ" and "sæbzi-hâ". There were no cases of broken (irregular) plurals in their speech. These cases can indicate that the production of more complex categories like plural nouns is difficult for autistic children.

Twenty percent of autistic children could not use the demonstratives correctly, but all the normal children used them correctly. In Persian the two demonstrative adjectives "ʔin" /this/ and "ʔinha" /these/ are used to refer to the thing that are here/near and the two others "ʔân" /that/ and "ʔânha" /those/ are used to refer to there/far. Some autistic children did not use the appropriate demonstrative adjective to refer to near or far. For example, one of the autistic children produced the incorrect sentence "ʔin t͡ʃist?" /what is this?/ instead of the correct one "ʔân t͡ʃist?" /what is that?/ Autistic children's difficulty in the correct uses of demonstrative adjectives could be the sign of their inability to distinguish between singular and plural nouns and near and far.

All the autistic children did not produced complex sentences. The sentence produced by these children was simple sentences which consisted of only two or three words. Furthermore, the use of conjunctions and the relative pronoun "ke" was not evident in their speech productions. Research has shown that the mean number of words in a sentence produced by a 5 year old child is 6 words (Halahan, 1996). This shows that autistic children unlike normal ones are not at the expected linguistic level to be able to produce complex sentences and their performance is therefore weaker.

The results of this research are in line with the researches of Bartolucci et al. (1976), Rapin & Dunn (2003) and Paul et al. (2005) in other languages and shows that in Persian autistic children in compare to their normal counterparts also have problems in phonetic-phonological and morpho-syntactic areas and appropriate treatment programs are needed to reduce these problems.

References

Baltaxe C. Use of contrastive stress in normal, aphasic, and autistic children. Speech and Hearing Research1984; 24:97–105.

Bartolucci G, Pierce SJ, Streiner D, Eppel PT. Phonological investigation of verbal autistic and mentally retarded subjects. Autism Child Schizophr 1976; 6:303–316.

Bartolucci G, Pierce SJ, Streiner D. Cross-sectional studies of grammatical morphemesin autistic and mentally retarded children. Autism and Developmental Disorders 1980; 10:39–49.

Brown, R. A first language: The early stages. Cambridge, MA: Harvard University Press; 1973.

Capps, L., Losh, M., & Thurber, C. The frog ate the bug and made his mouth sad'': Narrative competence in children with autism. J of Abnormal Child Psychology 2000; 28(2), 193–204.

Crystal D. Dictionary of Linguistics and Phonetics. Oxford: Blackwell; 2003.

Dabir Moghadam M. Linguistic Studies of Persian Language. Tehran: Nashr Daneshgahi; 2005;150.

Diehl, J. D., Bennetto, L., & Young, E. C. Story recall and narrative coherence of high-functioning children with autism spectrum disorders. J of Abnormal Child Psychology 2006; 34, 87–102.

Dunn, Lloyd M. & Dunn, Douglas M.. Peabody Picture Vocabulary Test (PPVT). Technical Report 2013;13(2):111-20.

Fay, W. & Schuler, A. Emerging Language in Autistic Children. Baltimore: University Park Press; 1980.

Fein, D., & Waterhouse, L. Autism is not a disorder of language. Boston, MA: Paper presented at the New England Child Language Association; 1979.

Gholamalizade Kh. Structure of Persian Language. Tehran: Ehyaye Ketab; 2007; 295-302.

Prizant B. Language acquisition and communicative behavior in autism: Toward an understanding of the "whole" of it Speech and Hearing Disorders1983; 48: 296-307.

Grice, H. P. Logic and conversation. In P. Cole & J. Morgan, editors. Syntax and semantics. NY: Academic Press; 1975. pp. 41–58.

Halahan D, Kafman J. Abnormal Children. Mashhad: Astan Ghods Razavi; 1996,333.

Hollingshead, A. B. Four factor index of social status. New Haven, CT: Yale University Department of Sociology; 1975.

Hoof E. Language Development. 4th ed. Belmont, CA: Wadsworth; 2009.

Kjelgaard M., Tager-Flusberg H. An Investigation of Language Impairment in Autism: Implications for Genetic Subgroups. *Lang Cogn Process* 2001; 16(2-3): 287–308.

Lewis FM, Murdoch BE, Woodyatt GC. Linguistic abilities in children with autism spectrum disorder.Research in Autism Spectrum Disorders 2007; 1: 85-100.

Lindgren KA, Folstein SE, Tomblin JB, Tager-Flusberg H. Language and reading abilities of children with autism spectrum disorders and specific language impairment and their first-degree relatives. *Autism Res 2009;* 2 (1):22-38**.**

Lord C, Paul R. Handbookof Autism and Pervasive Developmental Disorders. (2nded.).New York: John Wiley & Sons; 1997, 195–225.

Lord, C., & Pickles, A. Language level and nonverbal social-communicative behaviors in autistic and language delayed children. J of the Academy of Child and Adoles Psychiatry 1996; 35(11), 1542–1550.

Noens I, van Berckelaer-Onnes IA. Captured by details: sense-making, language and communication in autism. *J Commun Disord* 2005; 38: 123–41.

Oram Cary JE, Flagg EJ, Roberts W, Roberts TPL. Delayed mismatch field for speech and non-speech sounds in children with autism. C*og Neurosci Neuropsychol* 2005; 16 (5): 521-5.

Prizant B. Language acquisition and communicative behavior in autism: Toward an understanding of the "whole" of it. Speech and Hearing Disorders1983; 48: 296-307.

Prizant, B., & Duchan, J. The functions of immediate echolalia in autistic children. J of Speech and Hearing Disord 1981; 46, 241–249.

Rapin, I. Autistic children: Diagnosis and clinical features.Pediatrics1991; 87(5), 751–760.

Rapin I, & Dunn M. Update on the language disorders of individuals on the autistic spectrum. Brain and Development 2003; 25:166-172.

Sadock BJ, Saduk VA. Kaplan and Sadock's synopsis of psychiatry: behavioral sciences, clinical psychiatry. Rafiee H, Sobhanian Kh. (Persian translator) 9 edition. Tehran. Arjmand Publication Company; 2003. 3: PP: 359-72.

Shriberg, L. D., Paul, R., McSweeny, J. L., Klin, A. M., Cohen, D. J., & Volkmar, F. R. Speech and prosody characteristics of adolescents and adults with high-functioning autism and Asperger syndrome. J of Speech and Lang Hearing Res 2001; 44(5), 1097–1115.

Szatmari, P., Bryson, S., Boyle, M., Streiner, D., & Duku, E. Predictors of outcome among high functioning children with autism and Asperger syndrome. J of Child Psychology and Psychiatry 2003; 44(4), 520–528.

Tager-Flusberg H. A psychological approach to understanding the social and language impairment in autism. *Int Rev Psychiatry* 1999; 11(4): 325-34.

Tager-Flusberg H, Rogers S, Coper J, Landa R, Lord C, Paul R, Rice M, et al. Defining spoken language benchmarks and selecting measures of expressive language development for young children with autism spectrum disorders. *J Speech Lang Hear Res* 2009; 52(3): 643-55.

Tath K., dawson G., Meltzoff A., Greenson J., Fein D. Early Social, Imitation, Play, and Language Abilities of Young Non-Autistic Siblings of Children with Autism. *J Autism Dev Disord* 2007; 37(1): 145–57.

Whitehouse AJO, Watt HJ, Line EA, Bishop VM. Adult psychosocial outcomes of children with specific language impairment, pragmatic language impairment and autism. *Int J Lang Commun Disord* 2009; 44(4): 511-28.

Wolk L, Giesen J. A phonological investigation of four siblings with childhood autism. Communication Disorders 2000; 33: 371-389.

Zwaigenbaum L. Autistic spectrum disorders in preschool children. *Can Fam Physician* 2001; 47: 2037-42.