

Articulation Defects in Autistic Children's Speech

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Abstract:

The problem of autism is wide spreading nowadays all over the world. The paper tackles one of the main problems of autistic children that is poor pronunciation. This paper tries to figure out the reasons behind the pronunciation problems of autistic children and how to deal with such problems. The main objectives of the study are to find out the meaning of autism in general, stating the main symptoms of autistic children, specifying the problem of articulation and proposing the suitable ways of treatment to improve the autistic children's articulation. The data of the study consist of a recorded speech of nine students in the Hama'em Al Salam Centre for the treatment of autistic children. A form is designed for this purpose to identify the specific articulation problems of those autistic children. The data are recorded along one year of observation. After analyzing the data, the researcher reaches a conclusion that the reasons behind those problems in articulation are psychological ones which make the child does not want to exert extra effort to pronounce the words correctly. This is why they apply certain processes to make their speech less effortful such as deletion, substitution, assimilation or distortion. The paper proposes some solution to solve this problem of autistic children in order to make their speech as normal as possible.

Key words: Autism, articulation, distortion, substitution, deletion, defects.

العيوب النطقية في الكلام لدى أطفال التوحد

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الملخص:

تنتشر مشكلة التوحد بشكل واسع هذه الأيام في جميع أنحاء العالم. تناول البحث إحدى المشاكل الرئيسية التي يعاني منها الأطفال المصابين بالتوحد وهي ضعف النطق. يحاول هذا البحث معرفة أسباب مشاكل النطق لدى الأطفال المصابين بالتوحد وكيفية التعامل مع مثل هذه المشاكل. وتتمثل الأهداف الرئيسية للدراسة في معرفة معنى التوحد بشكل عام، وبيان الأعراض الرئيسية لدى الأطفال المصابين بالتوحد، وتحديد مشكلة النطق، واقتراح طرق العلاج المناسبة لتحسين النطق لدى الأطفال المصابين بالتوحد. تتكون عينة البحث من كلمة مسجلة لتسعة طلاب في مركز حمام السلام لعلاج الأطفال المصابين بالتوحد. وقد تم تصميم نموذج لهذا الغرض للتعرف على مشاكل النطق المحددة لدى هؤلاء الأطفال المصابين بالتوحد. وقد تم تسجيل البيانات على مدى سنة واحدة من المراقبة. وبعد تحليل البيانات توصل الباحث إلى نتيجة مفادها أن الأسباب الكامنة وراء تلك المشاكل في النطق هي أسباب نفسية تجعل الطفل لا يرغب في بذل مجهود إضافي لنطق الكلمات بشكل صحيح، ولهذا السبب يطبقون عمليات معينة لجعل كلامهم أقل جهداً مثل الحذف أو الاستبدال أو الاستيعاب أو التحريف. تقترح الورقة بعض الحلول لحل مشكلة الأطفال المصابين بالتوحد لجعل كلامهم طبيعياً قدر الإمكان.

الكلمات المفتاحية: الأطفال، التوحد، النطق.

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1. Introduction

Autism is an increasing problem that many children suffer from recently. ASD (Autism Spectrum Disorder) is a psycho-neurological problem that targets some children in the early age of their lives, its symptoms are poor communication with surrounding society, living in isolation, low interaction with people around them, poor skill, and low response to the behavioral stimuli. Concerning the general language problems, they are pronoun reversals, echolalia and articulation defects. The speech of autistic children is mainly characterized by speech delay and developmental phonological processes such as addition, reduction, distortion and final consonant deletion. Children with autism also suffer from non-developmental errors such as the nasal emission of specific phoneme and initial consonant deletion (Cleland et. al., 2010).

The main problem of the research is that what are the reasons behind the impaired production of speech? Are they purely psychological or physical due to some defect in the oral tract? The research will answer these questions in order to figure out the main problem and find the right possible solution. The data are collected from the Hama'im Al Salam Centre for Autistic Children Treatment. Nine children are selected to be the sample of the study. Their speech has been recorded for nearly one year to figure out the articulation problems of those selected children. The results show that pronunciation errors are a result of psychological disorders that lead to problem in the pronunciation of sounds. Deletion and distortion are the most occurring errors committed by autistic children. Substitution comes in the third level as a speech defect.

The paper is set out to answer the following questions:

- 1- What is the kind of language problems in autistic children?
- 2- What are the main reasons of the defect in the articulation of autistic speech?
- 3- What are the phonological errors that have been committed by autistic children?

In order to answer the questions above, the research aims at the following:

- 1- Stating the language problems of autistic children.
- 2- Investigating the main reasons of the defect of articulation of autistic children.
- 3- Specifying the phonological errors that have been committed by the autistic children.

The researcher hypothesizes the following:

- 1- The reasons of articulation defect are not only physical but also psychological.
- 2- Deletion and distortion errors are the most common errors committed by autistic children.

1.1 Articulation of Speech

This process means the right pronunciation of the speech sound of certain language. That right pronunciation depends on certain factors such as proper acquisition of language in linguistically rich environment, having the organs of speech without any physical defects, and having the healthy psychological and neurological ability to acquire and produce the speech sound correctly (Crystal, 2008: 16).

1.2 Organs of Speech

The organs of speech are those organs that participate in the production of the speech sound without any problem or difficulty. They are: lips, teeth, tongue, palate vocal cords, in addition to the lungs as initiators not organs of speech as they do not actually participate in the sounds production but they initiate the airstream which is modified by the organs of speech to become "speech" (Roach, 2009: 21).

1.2.1. Lips: two muscles that make the opening of the mouth, they are very essential to produce the bilabial sounds as /p, b, m, w/; in addition to that, they participate in the production of rounded vowel sound as / o. u/.

1.2.2. Teeth: two groups of semi bony structures that have several functions among which they participate in the production of the dental and labio-dental sounds as /f, v, ð, θ/.

1.2.3. Tongue: it is the most important organ of speech because it is crucial in the production of nearly all the sounds; some sounds need the tongue to be in the neutral position and this rest position is also a contribution. The tongue is divided into four areas: tip, front, back and root.

1.2.4. Palate: it is the roof of the mouth and it has a great importance in the production of alveolar, palate alveolar, palatal and velar sounds as / t, d, tʃ, j, k, g/.

1.2.5. Vocal Cords: these organs are two elastic tissues lie inside the larynx. Their function is very important as they produce the required voicing by vibrating the vocal cords to produce the voiced consonants and all the vowels. In addition, the vocal cords can participate in the production of

the voiceless consonants by being drawn apart and even in the glottal stops and fricatives (Ladefoged, 2006).

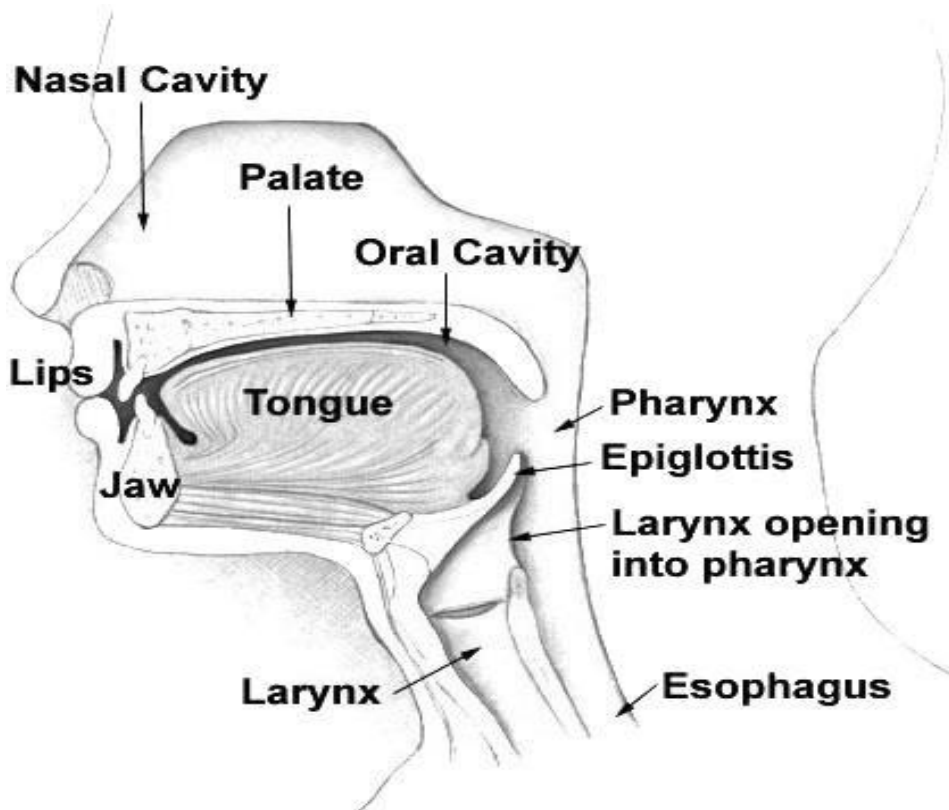


Figure (1) Organs of Speech

2 General Overview of Autism

It is a neuro-developmental behavioral disorder that some children at the early age before the thirtieth month may show a kind of difficulties in social interaction and communication and repetitive behaviour. Parents may notice the signs of the autism before the age of three years. The symptoms may include poor communication skills such as pronunciation.

The syndrome may develop to reach a sever level that needs a chemical and behavioral therapy (Landa, 2008).

In other words, autistic syndrome disorder is a developmental impairment that leads to challenges on the social, communicational, and behavioral levels. As the syndrome includes the term (spectrum), it means that it covers a wide range of syndromes, levels of impairment, and skills that the autistic children may have. ASD may affect its patients with different levels, it may be mild or sever according to different genetic, social, and environmental factors. Children with ASD share some symptoms such as social interaction difficulties and communication problem, the severity of symptoms differs from one patient to another, but there is a common ground in the overall symptoms (Tager-Flusberg and Kasari, 2013).

2.1 Linguistic Manifestations of Autism

Autistic children tend to live in isolation as if they live in their private world. This isolation will cause a kind of inability to communicate with others and they may have difficulty in language skills and even in understanding other people's utterances. ASD children's ability to communicate with others and use language relies on intellectual and social development. Some children have no ability to communicate with others. Some of them have very limited speaking skills, others may have a large amount of vocabulary and able to talk but on specific topic with elaborative details. Many other autistics have problems with lexical meaning of the words and the rhythm of words and sentences. Moreover, they may also be unable to understand body language such as hand gestures, facial expressions, and body movements. All these defects cause the overall disorder to communicate with other people especially of their same age (Tager-Flusberg and Kasari, 2013). According to what has been researched in the field of autism, three main problems can be stated: pronoun reversal, echolalia, and an articulation defect. They will be explained shortly in the next sections.

2.1.1 Pronoun Reversal

The reversed production of pronouns by autistic children reveals their apparent inability to recognize their own personal identity (Creak, 1961: 271). Such psychoanalytic interpretations continue through the twentieth century as Lee et al. (1994: 43) interpreted the difficulty of the autistic children's use of pronouns as a result of abnormalities in the way autistics children sense and conceptualize self and other in relation to one another.

Nowadays, the psychoanalytical explanations of autistic use of pronouns is persistent. For instance, Duff and Flattery (2014) recently explained that autistic children have a difficulty with pronouns, feeling dissipated of the understating of other and self in the reciprocal relationship. However, autistic children's use of pronouns may reveal a substitution of the first-person pronoun "I" with the second person pronoun "you" (Evans and Demuth, 2012). This is not unique to autistic children but also typical developing children may exhibit such a problem, but they would master the pronouns use with different ages (Clark, 1978).

2.1.2 Echolalia

Many scholars (such as: Kanner, 1943; Creak, 1961; Gernsbacher et al., 2005) state that repetitive speech or echolalia is considered a primary characteristic of autistic children since early descriptions of autistics speech. They indicate that most autistic tested children in their samples of studies show immediate or delayed echolalia.

As in the case of the pronoun reversal, echolalia produced by autistic children was considered according to the psychoanalytical terms as hostile behavior due to a failure of their ego development (Robert, 2014). From a behaviorism approach, echolalia produced by the autistic children was considered as a self-stimulatory behavior that interfered with their ability of learning. This is why Robert (2014) states that the treatment of the autistic children's echolalia must extinguish echolalia by punishment. In his point of view, the process of learning can be initiated.

2.1.3 Articulation Defects of Autistic Children

The speech of autistic children is mainly characterized by speech delay and developmental phonological processes such as gliding, cluster reduction, final consonant deletion. Children with autism also suffer from non-developmental errors such as phoneme specific nasal emission and initial consonant deletion (Cleland et al., 2010)

One of the key symptoms of the autistic children is the pronunciation disorder that include substitution, omission and distortion. Those disorders vary from mild to severe according to the individual case of the child. It is believed that the psychological problems of the autistic children lead them to isolate themselves rejecting all kinds of social communication. As a result, these psychological disorders force the child to pronounce the words with less effort. That is why the child tends to delete, substitute or distort a sound in a word (Ta'uma and Jaza'a, 2018).

The reasons behind the phonological process errors may be only psychological or even a physical problem in the organs of speech. A distinction must be made between the normal substitution of the normal children due to their immature organs of speech and the substitution problems of autistic children as the first occurred and treated according to certain rules and techniques but the latter has no clear cut rules to happen and it is accompanied by behavioral and communication problems (Ta'uma and Jaza'a, 2018).

Before going further to the section of data collection and analysis, a brief account is presented about the main articulation defect: substitution, omission, distortion and addition (Daymut, 2021).

2.1.3.1 Substitutions: Replacing one sound with another sound. Examples: "wed" for "red," "thoap" for "soap," "dut," for "duck"

2.1.3.2 Omissions (also known as deletions): Omitting a sound in a word. This error affects intelligibility, making speech more difficult for the listener(s) to understand. Examples: "p ay the piano" for "play the piano", "g een nake" for "green snake"

2.1.3.3 Distortions: the process of producing a sound in an unfamiliar manner. Examples: "pencil" (nasalized—sounds more like an "m") for "pencil," "sun" (lisp—sounds "slushy") for "sun"

2.1.3.4 Additions: Inserting an extra sound within a word. Examples: "buhlack horse" for "black horse," "doguh," for "dog".

3. Methodology

The data of the research is a kind of observation because the problem of the research is related to autistic children with defects in the articulation of speech. Therefore, the best way to collect data is to observe them and record information in a form that is designed for this purpose. The children are selected from the center of Hama'em Al Salam for treating the autistic children. The details of the data are stated below.

3.1 Data Collection and Description

The research is oriented to diagnose the problem of articulation in autistic speech. Nine impaired autistic children have been chosen. They have been observed for over one year to identify the misarticulation of their speech. The data have been recorded and analyzed according to designated form to identify, evaluate, classify and calculate the articulation disorders.

3.2 Participants

The participants are nine autistic children, their age is ranged from 5 to 7 years old, seven boys and two girls, they have been chosen haphazardly. The academic level of their parents was from the high school level to college degree level. The names of participants have been deleted from the research for privacy perspective but they are stated in their respective forms.

3.2 Data Length

The data of the research consists of a form designated to collect the information from the selected autistic children (see Appendix). The form involves a list of all the alphabets of Arabic occurring in initial, medial, and final position of a word. The participants are asked to pronounce the words successively in order to diagnose the pronunciation problems.

3.3 Data Theme

The main theme of the data is the problem of articulation of autistic children. Autistics are characterized by several symptoms but what is related to the paper is linguistic in general and phonetic related to articulation problems in particular. Hence, the focus is on the articulation defects as they are the main topic of the research.

3.4. Method of Analysis

According to form that was designated to test the autistic children's pronunciation of the Arabic sounds by giving them three words for each letter, the first has the letter in the initial position, the second has the letter in the medial position and the third has the letter in the final position. Their pronunciations were recorded and the type of articulation problem is identified. A sample of the form will be provided in the Appendix. The following are the details of the data collected with the exact numbers of the errors committed and their distribution among the positions. Moreover, the percentage of each error is also concluded from the data for all the three positions; initial, medial, and final (see table 1).

Concerning the initial position, the process of distortion was the highest score of 47 times of all the nine participants. Deletion comes at the next one to be 45 times. Substitution was the least problem of the participants

in the initial position with 28 scores. No addition has been committed by the participants.

In the medial position, again distortion scores are the highest level of 59 times. Then, the process of deletion occurred 51 times. The process of substitution occurred 29 times. The process of addition has not been committed at all in the medial position.

Finally, in the final position, the process of distortion is also the prominent one with 54 times. Then, the process of deletion comes with 42 times. Then, the process of substitution comes in the third grade to be 40 times. The process of addition has been committed only once in the final position. From the overall analysis, it can be seen clearly that the process of distortion and deletion are respectively the most prominent ones. The process of substitution comes in the third level. Finally, the process of addition occurred only once in the final position.



Table (1) the occurrence of the error processes in all word positions

No	Types of articulation defects in Initial position	Types of articulation defects in medial position	Types of articulation defects in final position
1	Sub=6 Dis= 2 Norm = 15 del=5 add=0	Sub= 4 Dis= 8 Norm= 9 del=7 add=0	Sub= 2 Dis= 8 Norm=12 del=6 add=0
2	Sub=7 Dis= 0 Norm=18 del=3 add	Sub=7 Dis= 0 Norm=16 del=5 add=0	Sub=9 Dis= 0 Norm=13 del=6 add=0
3	Sub=2 Dis= 1 Norm=21 del=4 add	Sub= 5 Dis= 1 Norm=17 del=5 add=0	Sub= 8 Dis= 0 Norm=19 del=1 add=0
4	Sub=5, add=0 ,Norm=6 del=7, Dis=10	Sub= 2 Dis= 12 Norm=9 del=5 add= 0	Sub= 6 Dis= 11 Norm=6 del=4 add=1
5	Sub=2 Dis= 22 Norm=2 del=2 add	Sub=1 Dis= 24 Norm=1 del=2 add=0	Sub= 3 Dis=23 Norm=1 del=1 add=0
6	Sub= 0 Dis= 3 Norm=12 del=13 add	Sub= 3 Dis= 2 Norm= 9 del=14 add= 0	Sub= 3 Dis= 2 Norm=13 del= 10 add=0
7	Sub= 2 Dis= 0 Norm=26 del=0 add	Sub= 4 Dis= 0 Norm= 24 del=0 add= 0	Sub= 2 Dis= 0 Norm=25 del=1 add= 0
8	Sub= 1 Dis= 9 Norm=11 del=7 add	Sub= 1 Dis= 10 Norm=10 del=7 add=0	Sub= 4 Dis= 7 Norm=11 del= 6 add=0
9	Sub= 3 Dis= 0 Norm=21 del=4 add	Sub= 2 Dis= 2 Norm=18 del=6 add=0	Sub= 3 Dis= 3 Norm=15 del= 7 add=0
Aggregate	Sub=28 Dis= 47 Norm= 132 del= 45 add=0	Sub= 29 Dis =59 Norm = 113 del= 51 add= 0	Sub =40 Dis = 54 Norm= 115 del= 42 add= 1

Sub =substitution, Del=deletion, add= addition , dist =distortion , Norm = normal

3.5. Results and Findings

After analyzing the recordings of the children's pronunciation, the following results are reached. Concerning the occurrence in the initial position, distortion and deletion are the most common errors with 18.6 % and 17.8 % respectively. Substitution occurred with 11.2 %, addition never comes to happen. In the medial position distortion and deletion are the most frequent errors committed by the informants with 20.2 % and 23.4 % respectively. Substitution comes in the third rank with 11%. Again, addition is never committed in the medial position. In the final position, the same gradation of occurrence is maintained. Distortion and deletion are the most prominent errors with 21.4% and 16.6 % respectively. Substitution also comes in the third rank to be 15.8%. Surprisingly, addition happens only once (i.e.) with the pronunciation of one letter out of 28 letter and in one position only which is final, so its percentage is 0.3%.

Table (2) the percentage of the occurrence of the pronunciation errors in all the three positions.

	Initial position	Medial position	Final position
substitution	11.2 %	11.5	15.8
deletion	17.8 %	20.2	16.6
addition	0%	0%	0.3
distortion	18.6	23.4	21.4
normal	52.3	44.8	45.6

Conclusions

According to the analysis of the data, the following points are concluded.

- 1- The pronunciation errors or articulation defects of autistic children are not of a physical abnormality only but also due to the psychological disorder.
- 2- Distortion and deletion are the most committed errors by the autistic children in all the three positions: initial, medial, and final.
- 3- Substitution comes in the third rank of the errors committed by the autistic children.
- 4- Addition is very rarely committed as only one child adds one sound in the final position only.
- 5- Articulation errors of autistic children are highly different from those errors of normal children, autistic children's errors are very hard to be diagnosed due to their wide variance whereas the errors of normal children are categorized by speech pathologists and they are easily diagnosed and in most of the cases they are treated spontaneously by their maturation.

Recommendations

- 1- Autistic children must be treated medically and behaviorally.
- 2- A lot of research is needed to be performed in the linguistic side of autism as the treatment of the autistic children in most of the specialized centers depends highly on the chemical therapy rather than the behavioral linguistic therapy.
- 3- The therapist and personnel in the autism treatment centers must be highly trained and qualified to deal with autistic children.

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Articulation Defects in Autistic Children's Speech (398)

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Index

The original form that is designated to collect the data from the sample of the study. The form included all the 28 alphabetical sounds with a word for each position and a picture refer to it. A translated version is also provided.



استمارة تطبيقية لبيانات تلثم الكلام للحالة

ID : 0001						
الصوت	في البداية	طريقة النطق	في الوسط	طريقة النطق	في الآخر	طريقة النطق
أ	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام
ب	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام	الكلمة والصورة التي تشير لها	سليمة لم ينطقها إبدال حذف إضافة تشويه الدغام

Applicable data form for collecting pronunciation errors

ID : 0001						
Way of pronunciation	Final pos.	Way of pronunciation	Medial pos.	Way of pronunciation	initial pos.	Sound
<u>normal</u>	The word and a picture refers to it	<u>normal</u>	The word and a picture refers to it	<u>normal</u>	The word and a picture refers to it	ا
<u>Not pron</u>		<u>Not pron</u>		<u>Not pron</u>		
<u>sub</u>		<u>sub</u>		<u>sub</u>		
<u>del</u>		<u>del</u>		<u>del</u>		
<u>add</u>		<u>add</u>		<u>add</u>		
<u>dist</u>		<u>dist</u>		<u>dist</u>		

assimilation		assimilation		assimilation		
<u>normal</u> <u>Not pron</u> <u>sub</u> <u>del</u> <u>add</u> <u>dist</u> assimilation	The word and a picture refers to it	<u>normal</u> <u>Not pron</u> <u>sub</u> <u>del</u> <u>add</u> <u>dist</u> assimilation	The word and a picture refers to it	<u>normal</u> <u>Not pron</u> <u>sub</u> <u>del</u> <u>add</u> <u>dist</u> assimilation	The word and a picture refers to it	ب