

The Speech Production in People with Autism (Case Study on a Girl Named Aliya Salsabila Ramadhani)

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Abstract— The study was conducted with the aim of finding out how speech production in people with autism with the object of research on a girl named Aliya Salsabila Ramadhani who is 9 years old. This research tried to explain the development of language and the production of Aliya speech. This study uses descriptive qualitative methods with psycholinguistic approaches that seek to describe the development of aliya language and speech production with narrative and brief exposure with primary data retrieval techniques through observation of video documentation of activities carried out and through questionnaires and interviews. In addition, this study also uses secondary data in the form of relevant references as study material so that holistic and thorough discussion results are obtained. From the characteristics that seem to be known that Aliya is classified as experiencing mild autism. It is also obtained through the analysis of language development and how Aliya interacts with the environment and the surrounding people. The development of language and speech production Aliya experienced significant progress after she received growth and speech therapy and attended the school of children with special needs although the resulting speech is still not perfect and there are certain phoneme pronunciations that are not right.

Keywords—Psycholinguistics; Speech Production; Autism.

I. INTRODUCTION

Man is given a tremendous gift from the Almighty in the form of mind so that man can use that grace to communicate through language. This is what distinguishes humans from other creatures who only use instinct to communicate. The working system of the human brain greatly affects its ability to speak. The human brain consists of three parts, namely the cerebette, cerebellette and brain stem. In the large brain there is a cerebral cortex which is the part that looks like white clumps and is the largest part of the human brain system. It is this part that regulates and manages cognitive processes in humans, one of which is language. The cerebral cortex consists of two parts: the left hemisphere and the right hemisphere. Both hemispheres have specificities in cognitive processes. The right hemisphere has a function to control the processing of spatial and visual information. While the left hemisphere serves to control language activities in addition to other cognitive processes. However, this does not mean that the right hemisphere does not play a role in language processing. Sentence intonation, for example, is controlled by the right hemisphere. So, the language process involves these two hemispheres of the brain. That way, humans can communicate using language and understand its meaning.

Communication carried out by humans includes various aspects of language skills, namely listening ability, speaking ability, reading ability and writing ability. These four abilities collaborate as a form of communication carried out by humans. But not everyone gets this perfection. There are people who have restrictions in communicating due to language disorders that occur in

themselves. Language disorders can be divided into two types, namely speech device disorders and speech disorders [1]. Speech device disorder is related to interference with speech tools. Basically, sufferers of this disorder can still communicate well with others. However, because one part of their devices was disturbed, they had problems when speaking.

If the affected disorder is part of the lungs, the tone of speech is very monotonous, the voice is very small and disjointed. If the affected disorder is part of his vocal cords, his voice is hoarse or missing. If the affected disorder is the tongue then the pronunciation of a number of phonemes involving the tongue becomes imperfect. If his lips are cleft, or disturbed is the sounds also produces imperfect.

Speech disorders are related to disorders of the brain. This disorder occurs due to rupture of blood vessels, blockage of blood vessels or inhibition of oxygen flow in the brain. This disorder is known as stroke. If there is damage to the left hemisphere then there is a speech disorder called aphasia. Aphasia sufferers are distinguished into broca aphasia and wernicke aphasia depending on which part of the brain is damaged. In addition, there are also known disorders in other language processes such as disartria, agnosia, aleksia, agrafia and language disorders in people with autism.

On the other hand, other expert [2] divides language disorders into four categories, namely biological language disorders, cognitive language disorders, psychogenic language disorders and linguistic language disorders. In addition, there are also language disorders in particular, including aphasia and autism spectrum. In this study will be studied about the development of speech production in people with autism with the object of research on a 9-year-old girl named Aliya Salsabila Ramadhani.

A person can experience autism due to several causes, including due to genetic factors, transmission during the womb, for example, side effects to alcoholic beverages or drugs (especially epilepsy drugs for pregnant women) during the womb, the influence of other disorders, such as down syndrome, cerebral palsy and premature birth, especially babies born at 26 weeks of pregnancy or less [3]. Children with autism in addition to experiencing disturbances in speech and language production also experience socializing disorders and disorders of behaving as usual they tend to be alone and busy with their own activities even some even to do activities that harm themselves such as biting fingers hard or banging their heads against the wall.

Autism is a disorder or syndrome that interferes with the development of basic compound psychological functions, such as behavioral development, language, and motor movements. It is not surprising that people with autism experience impairment in carrying out cognitive, emotional, and psychomotor functions. One of the problems in autistic children is communication problems, especially in speech production.

When talking about language acquisition, this will be related to how a person has the ability to speak and how ideas are contained in words. Then when discussing the understanding of language then it will be related to how a person understands, stores, and recalls information, while related to the production of language then this will include how one can speak, hear, write and read. While the discussion of language production will examine how speech is produced from the formation of ideas in reason until the seconds of speech are produced [4].

This study will examine speech production in people with autism with a case study in a 9-year-old girl who has autism. In this study will be described briefly how the production of speech and language of the child. Related to the production of speech itself, there are four stages that are passed when a person produces a speech, namely the message level, functional level, positional level and phonological level. So this study will focus on how people with autism go through four stages in the production of speech.

II. THEORETICAL STUDIES

2.1. Definition of Autism

The word autism comes from the Greek word 'autos' which means self so that autism can be interpreted as someone who is always busy with his own world and not obsessed with the environment and interactions with others. No wonder that children with autism will be indifferent to their environment [5]. In addition, they will be very rigid with the routine that they like because that is the focus in the nature of their mind

Autism or also known as Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder characterized by impairments in social interaction, verbal and non-verbal communication, and shows limitations in activities and interests [6]. This causes a person with autism to be unable to socialize with the environment and people around them like normal children. People with autism also have impairments in language and communication.

Autism can be interpreted as a defect in human neurodevelopment and psychological development that occurs from the fetus onwards causing weakness or differences in social interaction, communication skills, patterns of interest and behavior [7]. Examples of signs that characterize autism include: not wanting to make eye contact; not wanting to interact; communication limitations; slow learning of language, hyperactivity; walking tiptoeing or circling; self-stimulation; likes to shake his head; sensitive to certain sounds; metabolic or digestive disorders and sleep patterns; like to shout to themselves; often speaking, laughing or crying on their own for no apparent reason; bites of pencils, hair, nails, toys, edges of hijab or clothing; like to look to see small things. when lifting or picking up an object, their eyes always approach it; arranging objects in line, likes to smell objects, cannot sit still; cannot coordinate one's own movements; often perform movements that use strong power such as running around, patting hands hard; and so on [8].

Of the many signs that characterize autism above, limited communication and slow learning of language are characteristics that indicate language disorders and produce speech. Language disorders in children with autism can vary, there are children who can not produce speech at all, there are children who can produce speech but have obstacles to the pronunciation of certain phonemes or there are children who speak fluently but the order of words produced is irregular. Then there are also children with autism who often repeat words or sentences and many more models of language disorders and speech production seen in children with autism.

Meanwhile, there are three problems related to autism, namely communication problems, social interaction problems and behavioral problems [9]. Communication problems are related to language disorders and the production of speech they experience, while social interaction problems are related to their ability to socialize with the environment and those around them and behavioral problems related to the conditions of how they behave that sometimes hurt themselves or perform reps on certain movements.

A person with autism can be classified into 3 groups depending on the level and components considered, namely mild, moderate and severe. The components that are considered there are fourteen, namely relationships with others, imitation or mimicking, emotional response, body use, use of objects, adaptation to changes, vision response, auditory response, touch and smell response, fear and anxiety, verbal communication and speech, mimicry and expression, activity and cleverness [10]. These fourteen components can determine which degree a person with autism can be classified.

Based on the exposure of opinions that have been explained above, it can be concluded that autism is a disorder that occurs in the nerves in the brain that causes obstacles in communicating, behavior and socializing. Children with autism show certain signs that set them apart from normal children. One of the signs is language disorders and producing speech that will be discussed in this study.

2.2. Speech Production Concept

Speech production is a process that is done to pour ideas in the mind that is contained in the form of vocalizations. There are 4 stages of levels that are passed when speech production is carried out [11]. The four stages can be explained through the following images:

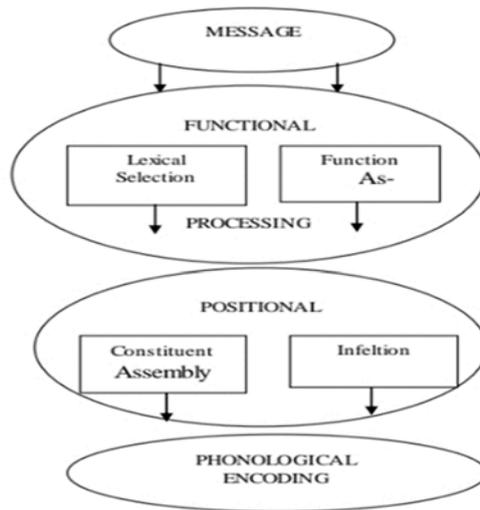
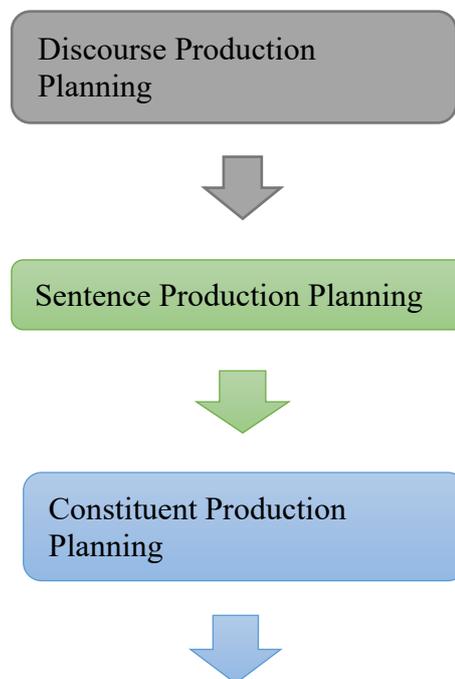


Fig. 1. Bock and Levelt Model of Speech Production Stages

The first stage is known as messaging (message level) that at this stage the speaker collects notions of the meaning to be conveyed. Then go to the second stage, which is functional (function level) where the speaker will give functions to the word to be produced related to syntactic and grammatical functions. Then the next stage is positional (positional level). At this stage the brain will work to sort the lexical form for the speech issued. While in the last stage is known as phonological (phonological level) which at this level the result of the position stage will be produced through the form of sound.

When someone wants to convey a message in the form of speech then there will be a certain specific topic that will be formed in the formulation of the idea in mind, then the idea about the topic will be derived in the form of the next sentence to represent the idea then selected certain constituents which are then expressed in the form of sound. This view is in line about the articulation plan formed and how to articulate it [12]. In summary this procedure covers five stages, namely: discourse production planning, sentence production planning, constituent production planning, articulation program and articulations. This procedure can be displayed in the form of the following images:



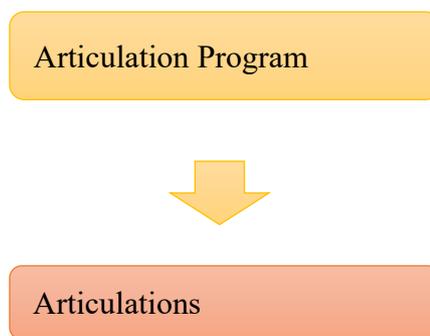


Fig. 2. Clark and Clark Model of Articulation Plan

If Bock and Levelt's and Clark and Clark opinions are compared, there can be some similarities in the process of speech production and articulation. The stage of messaging according to Bock and Levelt can be juxtaposed with the stages of discourse production planning according to Clark and Clark because these two stages both talk about the initial level of the formation of ideas in the mind. The level of message and production planning discourse explains the first step in producing speech through the process of articulation in the state of the concept of ideas. While the level of function according to Bock and Levelt and sentence production planning according to Clark and Clark have the same level of stages where the brain will work to provide functions in words related to syntactic and grammatical embodied in the formation of sentences. Then the next stage according to Bock and Levelt is the level of position that contains the same meaning as the planning of constituent production according to Clark and Clark where there will be a sequence of selected constituents before the representation of the constituent is in sound. Furthermore, the last stage according to Bock and Levelt, namely the level of phonology according to Clark and Clark is divided into two, namely the articulation program and articulation itself where at this stage the speech is produced.

Based on the above presentation, it can be concluded that speech production has certain concepts and stages that start from the level of ideas until the speech is produced. This stage will be passed by everyone in producing speech.

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III. RESEARCH METHODS

This study is a descriptive qualitative study that uses documentation, observation, interview and questionnaire techniques and the approach used is through psycholinguistic approaches. The object of the study focused on the production of speech with autism with a case study in a girl named Aliya Salsabila Ramadhani who is 9 years old. The primary data from this study was obtained through documentation in the form of speech activity videos produced by Aliya. In addition, the primary data was also obtained through observations of activities conducted by Aliya and in-depth interviews and questionnaires aimed at Aliya's parents that contained aspects related to the autism suffered by Aliya and its influence on speech production and Aliya language development. While secondary data is obtained through literature studies conducted through journals, books, articles related to the topics discussed in this study. The research procedure that will be carried out there are two, the first is to determine the level of autism suffered by Aliya and the second relates to the speech production of Aliya and the stages that are passed in producing speech through the articulation process.

IV. RESULT AND DISCUSSIONS

There are fourteen components that need to be considered in determining the level of autism level of a child, namely relationship with others, imitation or mimicry, emotional response, body use, use of objects, adaptation to changes, vision response, auditory response, response to touch and smell, fear and anxiety, verbal communication and speech, mimicry and expression, activity and intelligence, then obtained an overview of Aliya's condition described through the following table:

Table 1. Description of Aliya's Condition

No.	Component	Aliya's Condition
1.	Relationships with other people	The child does not want to look or look into the eyes of adults when spoken to. Feeling annoyed when invited to interact. Sometimes she is too cuddled or attached to her parents too much for her age. Sometimes she looks shy
2.	Imitation	The child still wants to imitate simple things or behaviors such as clapping, one or two words. The rest is difficult to ask her to imitate.
3.	Emotional response	Sometimes the child shows an emotional response that does not match the type and degree. Only laughs when she sees something she likes. Emotional responses do not match the surrounding situation.
4.	Body use	The child shows strange movements, for example, is not agile or unskilled. She also exhibits indistinct repetitive movements.
5.	Object use	The child likes to lose interest in toys and play less in accordance with the function of the toy, for example being sucked, kissed or slammed.
6.	Adaptation to change	When the routine changes, the child will try to do the old routine.
7.	Visual response	The child does not like to look at objects around her or is always reminded to look at things. She prefers to look at glass or a certain light or something spinning like a fan or a wheel. She also didn't want to look into other people's faces.
8.	Auditory response	The child doesn't seem to hear when called but if she hears something she like, she immediately show a response. When called must be repeated or the response is slow. Sometimes she is afraid of certain sounds that she shouldn't be afraid of.
9.	Response to touch and smell	The child likes to put things in her mouths or smell objects even though they have no taste or smell. The reaction to pain is excessive or vice versa, such as not feeling pain. She also did not like be stroked and cuddled, when she is picked up she refused
10.	Fear and restlessness	The child shows a fear of certain objects or certain sounds such as thunder
11.	Verbal communication and speaking skills	The child shows a speech delay. Speech is still there even though it is difficult to understand it.

12.	Mimics and expressions	Flat child expression. Her expression does not reflect the ability to communicate.
13.	Activity	The degree of activity does not disturb the surrounding environment.
14.	Cleverness	The child is not smart. Lack of ability in all areas.

Based on the description of the fourteen components above, Aliya's condition is classified as a mild autism sufferer. Aliya since the age of five years has attended ABK Bina Cendekia and participated in growth and speech therapy continuously. Aliya also has restrictions on certain types of foods including ice cream and foods that contain a lot of sugar and seasoning and foods made from wheat flour. This is done in order to suppress the trigger factors of hyperactive and excessive movements carried out by Aliya and indigestion in absorbing certain food substances that she experienced. She is nine years old now and she communicates by using the phrase 'mau ini' and point out to what she wants but not in full sentence. She is now able to communicate even though his parents sometimes find it difficult to understand what she wants. Aliya is able to communicate in two directions in a simple way and even when she has difficulties, she can also ask for help from those closest to her.

After knowing the level of autism suffered by Aliya, the next discussion is about how the speech production is produced by Aliya. Aliya's speech production is still incomplete and there are even imperfect pronunciations of phonemes. Aliya's mother uses the term 'umi' but Aliya prefers to use the term 'mamah' rather than 'umi'. So when Aliya said what she meant to her mother, Aliya used the word 'mama', for example, 'mama, mamam' (mama, mau makan) to express the intention that Aliya wanted to eat. Then when she wants to drink, Aliya uses the phrase 'ma minuh' (mama, mau minum) which means mama, wants to drink or 'ma mimim' (mama, mau minum). But between the phrases 'ma minuh' and 'ma mimim' Aliya more often uses the phrase 'ma mimim' when expressing the desire to drink. Furthermore, Aliya said 'mam emi' (ma, mau mie) which means 'mom, I want to eat noodles' or said 'ouw atuh akih' (oh, jatuh sakit) which means 'oh, it is hurt' with a grinning expression. Aliya also uses the phrase 'ma mau ini' and points to something she wants or uses the phrase 'ma ikuh' (ma, mau ikut) which means 'mom, I want to come'. Aliya also often uses the phrase 'ma ap ati' (ma, HP mati) which means 'mama's cellphone is dead' and expresses 'tu tu ada amuh' (itu ada nyamuk) which means 'there are mosquitoes'. From the examples of utterances produced by Aliya, it can be seen that Aliya, who is 9 years old, is able to communicate in two directions, but sometimes her parents have difficulty understanding the meaning of Aliya's speech. Aliya often uses the production of the voiced bilabial nasal /m/ to start her spoken words more often than the others and the voiceless glottal fricative /h/ at the end of her speech.

If examined through the procedure or mechanism of how Aliya's speech production is produced according to Bock and Levelt's theory, the following points will be known:

1. Message Level (Messaging)

At this stage, the speaker will collect the notions of the meaning to be conveyed. For example, when Aliya produces the utterance 'tu tu tuh ada amuh' (itu ada nyamuk) which means 'there is a mosquito' then the thoughts that come to Aliya's mind are: (a) There is a small animal, (b) the animal is called a mosquito, (c) the mosquito is nearby.

2. Function Level (Functional)

At the functional level, two things will be processed, namely the first is choosing the lexical form that matches the message you want to convey and the grammatical information for each of the lexical forms. For example, of the many small animals that Aliya knows, she refers to a small animal called a mosquito. Aliya gave an understanding that the mosquito she was pointing at was not another small animal such as a fly or dragonfly. And the second in this level of function is to give functions to the selected words, for example, 'itu' are as subject and 'ada' as linking verbs and 'nyamuk' as object.

3. Position Level (Positional)

At this stage, the lexical form of the issued utterance is sorted. This sorting is based on a hierarchical unity of meaning. For example, the word 'nyamuk' is linked to the word 'ada' and the word 'itu' precedes the phrase 'ada nyamuk'.

4. Phonological Level (Phonological Encoding)

At this stage the position processing that has been completed will be sent to the phonological level to be realized in the form of sound. In Aliya's case, Aliya's phonotactic sequence is good, but the selection of the resulting constituents is not perfect and there are even phoneme pronunciations that don't fit. This phonological process is not simple because it is related to biological and neurological processes (Dardjowidjodjo in Albab, 2018). Due to the autism disorder that Aliya suffers which is a neurological disorder in the brain, when Aliya intends to convey that 'itu ada nyamuk' (there is a mosquito), the choice of phoneme that is uttered is in the form of the phrase 'tu tu tuh ada amuh'. The representation of the word 'itu' is produced through repeated utterances of 'tu tu tuh' while 'amuh' is a representation of the articulation of the utterance of 'nyamuk' (mosquito).

So in Aliya's case, because she has mild autism disorder, when she communicates she has imperfections in her speech production, although in the level of ideas she refers to the same meaning, but when the articulation process takes place, the utterance of the sentence is not perfect.

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V. CONCLUSION

Based on the explanation above, it can be concluded that Aliya is a 9-year-old girl with mild autism disorder who is now able to communicate in two directions but still has certain limitations. Aliya's speech production is still not perfect and there are some pronunciations of certain phonemes that are still not right, however, Aliya's speech can still be understood although sometimes it takes a long time to understand her speech. Aliya's imperfect speech process is at the phonological or phonological encoding level which still needs to be trained in order to be close to perfect.

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