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Phonological Disorder in Children with Autism

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ABSTRACT

Perception may have a role to play in shaping phonological systems but that it should not be included in the linguistic component of language-specific sound structure. These skills relate to language disorders, specifically Phonological Disorder. Children diagnosed with "Phonological Disorder" experience delays in language development and have difficulty with comprehension and expression. In this study, phonological analyses were performed on four children with autism. Speech elicitation included object naming and a connected speech sample. Data analyses involved phonetic inventory, phonological process analyses, and percentage consonants correct. Results showed that all four children exhibited both delayed phonological behavior as well as some atypical phonological behavior and severity of language impairment. The result of this research can enable accurate explanation and modeling of the communication of children with Phonological Disorder and the therapist may also make intervention to improve the interactions in helping children with autism in the nature of the condition more fully.

Keywords: Phonological disorder, autism, atypical

Introduction

One possible source of communication problems in individuals with autism is their failure to put the individual sounds of spoken language in context. For instance, in conversation people frequently mispronounce words. Some research found that individuals with "autistic traits" are less likely to put the word into context to correctly perceive the intended word. Autism is a complex neurodevelopmental disorder characterized by severe impairments in social interaction and communication and accompanied by a range of repetitive behaviors and restricted interests (American Psychiatric Association, 2000).

In its conjunction with language, people with autism can be classified into two groups, the first is the people with low-functioning Autism and the second is the people with high-functioning Autism. People low-functioning Autism cannot speak at all or are only able to communicate with Echolalic Speech. It is the repetition of a word or group of words spoken by the previous speakers. Echolalic Speech can be divided into two: direct echolalia and delayed echolalia. In direct echolalia, people with Autism directly repeat the words uttered by the previous speakers immediately after completion. While, in delayed echolalia, the repetition of these words are separated by pauses between speech by the previous speaker and people with Autism. People high-functioning Autism have the ability to speak relatively better than people with low-functioning Autism. However, the language used is still limited to a particular topic they like. People with high-functioning Autism show no progress in their ability to communicate along with the development of linguistic ability, unlike normal children in general.

Research relating to people with Autism and the ability to speak is conducted more from a medical standpoint, not from the angle of language (linguistic). Whereas, phonology study becomes very important to find solutions for people with Autism. Therefore it is necessary to study the linguistics ability for children with Autism given the fact that communication is something that is very difficult because they have problems in developmental language (Handojo, 2003). Research on phonological disorder in people with autism has not been found in Indonesia, also in related research journals currently, it is still difficult to find. Seeing the reality, an estimated of 112,000 children in Indonesia bears autism, in the age range of about 5-19 years old. It means that the number of people with autism increase five times each year up to (http://www.republika.co.id/berita/nasional/umum/13/04/09/mkz2un).

Language disorder is a disorder involving the processing of linguistic information. Problems that may be experienced can involve grammar (syntax and/or morphology), and phonology as a basic assumption to produce speech sounds, or other aspects of the language. This problem can involve language comprehension disorders, language production, or a combination of both. Language disorders or destruction are generally known as aphasia. Aphasia is a language disorder caused by damage to areas of the brain responsible for language comprehension and expression

The process of phonological acquisition occurs gradually, until the moment there is the real acquisition of the phonological system. However, in some cases, that process may last longer time, until children are no more than six years old, still considered as typical, because of individual variation. In that period, children present different development phases and they use several strategies when they perceive the complex behavior of the phonological units of the system they are acquiring. There may be phonemic substitutions or even omissions/not performance of segments and also of complex syllabic structures.

However, for children with autism, the phonological information processing occurs different than it is expected for them, with some difficulties in the acquisition of the target phonological system and/or mental organization of the language sounds Those cases are called phonological disorders (PD), which present alterations in the typical speech development, when speech becomes, in some cases, unintelligible.

Phonological deficits are common in language disorders in children with autism. The investigation whether or not syntactic deficits occur in a given acquired or developmental language disorder, which syntactic structures or processes are eventually affected and how to capture such deficits in an explanatory theoretical account has dominated the linguistic research on language disorders since its very first beginnings to the present.

A child with phonological disorders is more at risk for later developing problems when learning to read or spell and is potentially at risk for other learning disabilities. Correcting phonological problems can result in improved reading and spelling skills; however, this may not always be the case, it is depending on the severity of the problem, especially for children with autism.

The purpose of this study is to verify in the general phonological system which phones are omitted in by autism children with phonological disorders and try to find out to what extent the possibility of appropriate therapy for people with Autism

Theoretical Framework

Autism and Language

Autism Spectrum Disorder (ASD) is a developmental disability caused by differences in the brain. Scientists do not know yet exactly what causes these differences for most people with ASD. However, some people with ASD have a known difference, such as a genetic

condition. There are multiple causes of ASD, although most are not yet known. There is often nothing about how people with ASD look that sets them apart from other people, but they may communicate, interact, behave, and learn in ways that are different from most other people. The learning, thinking, and problem-solving abilities of people with ASD can range from gifted to severely challenge.

In psychological studies, children with autism are integral part of exceptional children. Hadis (2006: 43) states that children with autism are children who experience severe developmental disorder that among other affects the way a person to communicate and relate to others. Autism is also an organic developmental disorder affecting the ability of children to interact and live their lives (Hanafi in Hadis 2006: 2002).

Children on the autism spectrum often have communication problems more complex than straightforward speech and language difficulties. Characteristically they can find it hard to interpret social behavior and imagine another individual's state of mind. Reluctance to interact with the world may be evident in the way they fail to make eye contact, use hand gestures, or understand body language.

This developmental disorder is highly complex involving communication, social interaction, and activities children's imagination, as well as children's emotion. In other words, in children with autism, there are severe constraints on the ability of the verbal and non-verbal interaction development. Communication disorders that can occur in people with autism are verbal or nonverbal disorders. Speech and language disorders in people with autism include:

- a. Ability to use a language has been delayed or totally unable to speak. Using words without connecting them with the meaning commonly used.
- b. Communicating with body language and can only communicate in a short time.
- c. Words not understandable to others.
- d. Not understanding or not using words in the appropriate contexts.
- e. Echolalia (mimicking or parroting), mimicking words, sentences or songs without knowing the meaning and monotonous speech.
- f. Speaking is not used for communication and flat expression.

As children with autism have severe impairments in communication and are often reluctant to speak, especially around unknown people, a broad analysis of their verbal skills remains challenging. That is why it is only a few studies have focused on the ability of the autistic speech.

From the standpoint of neurolinguistics, the cause of autism is the difficulty of sufferer in functioning the sensory integration and sequencing process. This function is the basis for the development of communication systems and linguistics. Disruptions of the use of verbal language for communication, communication interactions, and inability to read body language, facial expressions, or tone of voice indicate that neurologically, the children suffer damage to both hemispheres of the brain.

Phonological Disorders

Phonology is the sound system of language. The phonology of language tells us how sounds fit together in words. Children who have phonology disorders have not learned the rules for how sounds fit together to make words, and use certain processes to simplify words. Phonology disorders are related to language and reading and are now seen as a languagebased disorder. Children with phonology disorders are frequently unintelligible; often, their parents are the only ones who can understand them, and even they have difficulties. It could

be more difficult for autism children with this disorder as they are not only at a very high risk for later reading and learning disabilities, but also in their communication.

Phonological Disorder is also known as a group of language disorders, whose cause is unclear, that affect children's ability to develop easily understood speech by the age. In some children, phonological disorder affects the ability to learn to read and spell. The term phonological disorder also refers to a person's difficulty understanding the sound system and speech rules of our language that other children seem to acquire naturally. (Hudson, 2009)

Specifically phonological disorder affects a speaker's production and mental representation of speech sounds. It may reflect an inability to articulate speech sounds. These disorders are broader in scope and more complex than simple articulation deficits.

Phonological Disorder (Grunwell, 1987) is characterized by:

- A static speech sound system
- Variability without gradual improvement
- Persisting phonological processes
- Chronological mismatch
- Idiosyncratic rules
- Restricted use of contrast

Inconsistent Speech Disorder is a type of phonological disorder. Children with Inconsistent Speech Disorder have at least 40% of words produced variably (inconsistently) (Dodd, B. and Iacono, T. 1989). In essence, the child with a phonological disorder has a *language* difficulty affecting their ability to learn and organize their speech sounds into a system of 'sound patterns' or 'sound contrasts'. The problem is at a *linguistic* level (i.e., the phonemic level) and there is no impairment to the child's larynx, lips, tongue, palate or jaw. The children with autism may have difficulty with pronouncing the words.

To see what phones are omitted by samples observed, the speech sample obtained through the conversation class and informal interview was transcribed phonetically and analyzed by contrast by using the theory of Phonological Processes by Barbara Hudson (2009). Phonological processes basically are patterns of sound errors that typically developing children use to simplify speech as they are learning to talk. As the autism children are very difficult to pronounce, it is considered that this approach will be suitable to apply to this data. Based on the data there are many different patterns of simplifications or phonological processes. One of the most common is called "cluster reduction". The children observed produced a sound blend (like [bl] [sp] or [tr]) and omit one of the sounds: "blus" becomes "bu", "spesial" becomes "pesial", and "truk" becomes "tu". Another common process is called "velar fronting". Children who use this process substitute sounds produced in the front of the mouth (t, d, n) for sounds produced in the back of the throat (k, g). In this instance, "dug...gug" becomes "guk...guk", "kartu" becomes "tartu", "gojek" becomes "dojek" and "kanan" becomes "tanan".

Results and Discussion

This study was a qualitative research with samples of for persons with autism aged 12 to 15 years old. The speech sample, obtained through the autism children with phonological disorder who study in a service center for people with autism in West Jakarta. The data was transcribed phonetically and analyzed by contrast. Then, it was reviewed by two other researchers with experience in phonetic transcription and perceptive/heard analysis. The transcription would be analyzed to obtain the information how they pronounce and on which

aspect of phoneme disorder more prominent. The research subject was a service center for people with autism in West Jakarta. A number of people trained in the center were 20 people aged between 7-19 years old with an average length of staying in this service center of eight years. For the needs of this research, the study took four people as samples with the age relatively not much different, namely Dira (12 years old), Tina (13 years old), Peter (14 years old), Jantan (15 years old) with the consideration that the development of behavior, intelligence, and maturity were relatively similar. So it could be easier to draw conclusions mutually reinforcing so that the level of result accuracy was high.

Dira: She is a 12 years old girl. She is first daughter of 4 children in her family. She was raised by her grandmother. She grows into a shy girl and a relatively difficult to communicate with fiends compared to people with autism in general, except with her teachers

Tina: She is a 13 years old girl. She is the second child of three brothers. Her two brothers are not people with autism and living in normal conditions. She has already joined the service center over 7 years. she grows into a cheerful child and has a relatively adequate knowledge compared to people with autism in general

Peter: He is a 14 years old young boy. He is the youngest son in his family. His two brothers are not people with autism and living in normal conditions. He does not belong to a cheerful child like Tina. He understands the instruction, communicate with others but the autistic trait could be seen dominantly on him.

Jantan: He is a 15 years old boy. She is an only child and his father had passed away since he was a baby. He was raised by her mother, who works as an instructor in the service center for people with autism where he studied. He is the best student in pronouncing the words even though cluster reduction still colors his sentences.

To see what phones are omitted by samples observed and to what extent the possibility of appropriate therapy for people with Autism, the speech sample obtained through the conversation class and informal interview was transcribed phonetically and analyzed by contrast. According to the results, it was determined that sounds omission produced by autism children with phonological disorder observed as shown in figure below.



Figure 1: Sound omission

Figure 1 above illustrates the results of observations performed six times on the four research subjects, it was determined the severity of the phonological disorders through the number of the omission of phonemes can be classified just as the process of phonological acquisition occurred as the normal children until the moment there is the real acquisition of the phonological system. However, autism children, the phonological information processing

occurs different than it is expected for them, with some difficulties in the acquisition of the target phonological system and/or mental organization of the language sounds. Those cases are called phonological disorders, which presents alterations in the typical speech development.

Based on the data the omission or the alteration occurs not only following the process of phonological system but also specific omission. From fifty numbers of words observed, there are unexpectedly found that the participants of the research replaced vowels sound into consonant. According to some studies, children with the phonological disorder will have the same development with the acquisition of the phonological system in normal children, but they don't show any development in pronouncing words as expected at their age. Following the same idea, there is a research which verifies that most omissions occurred for /R, /r/ e /l/. It shows that the typical phonological development is similar to the atypical development, but it is different with autism children. Besides, omissions of the phonemes mentioned above, there are more cases of improper speech pattern. Some examples are shown in table 1 below taken from the observed words.

r		
Process	Samples Data Observed	Description
Fronting	Tartu for kartu dojok	sound made in the back of the mouth
	for gojek, gukguk for	(velar) is replaced with a sound made in
	dugdug	the front of the mouth (e.g., alveolar)
Stopping	tinar for sinar, tanan for	fricative and/or affricate is replaced
	kanan	with a stop sound
Gliding	wama for rumah	liquid (/r/, /l/) is replaced with a glide
		(/w/, /j/)
Cluster	top for stop, pesial for	consonant cluster is simplified into a
Reduction	special, bu <i>for</i> blus, tuk	single consonant
	<i>for</i> truk	
Final	<i>bi</i> for <i>bis</i> , <i>pa</i> for <i>pas</i>	deletion of the final consonant of a
Consonant		word
Deletion		
Others	Keternet for internet,	Open vowel is replaced with a sound
	Koforma for informa	made in the front of the mouth (e.g.,
	kikan for ikan,	alveolar), liquid (/l)) with open vowel is
	kangkaran for lingkaran,	replaced with a sound made in the front
	kehutanan <i>for</i> ketuhanan	of the mouth (e.g., alveolar) and even
		stop sound is replaced with fricative

Table 1 Phonemes Omission

Based on the results of observations, it was found that they have different characteristic in responding to questions asked by interlocutors. Jantan is the best among them. However, the error in pronouncing word still colors his utterances. Dira and Peter had difficulty in expressive language, besides they have very limited vocabularies, they have some problems in pronouncing words. The vocabulary they mastered was limited and their articulation was not clear, the voice faltered in almost every word. They demonstrate "typical" errors and phonological patterns as children in developmental process during this acquisition period. For example, it is considered typical and acceptable for younger children to replace later-acquired sounds, such as /s/, with earlier-acquired sounds, such as /t/. Besides

that, they also produce the differentiate typical errors from those that are unusual or not ageappropriate.

Conclusion

Through this study, it was verified that the omission of phones in simple onset position occurred mostly as in the earlier age normal children (five years old). Moreover, it is still found that Dita and Peter tendency presented higher number of different type of omissions (atypical omission). It is considered that the findings of this research provide extra knowledge of the procedures of teaching the autism children with phonological disorder to produce utterances, mainly the children with atypical omission. Thus, the present study can also be considered as warning for speech-language therapists not to ignore sounds omissions, even by autism children, because they reflect little phonological knowledge, what may generate problems in the future in communication.

It is very suggested to make intervention or therapy in teaching autism children with phonological disorder that can, in most cases, make a huge difference. The therapy can refer to the application of phonological principles to the treatment of "normal children" with phonological disorders. The phonological principles are that phonological intervention:

- is based on the systematic nature of phonology
- is characterised by conceptual, rather than motoric, activities
- aims to facilitate age-appropriate phonological patterns through activities that encourage and nurture the development of the appropriate cognitive organisation of the child's underlying phonological system
- has generalisation as its ultimate goal.

Therapist should also encourage autism children to have the orthographic mastery; that is, the ability to process the visual form of words in terms of shapes, letters and their order in words. Through orthographic mastery, words are processed as a whole unit rather than their component sounds to yield meaning. Besides orthographic mastery, phonologic mastery with phonological disorder is also important for autism children, the ability to translate letters into the sounds (i.e., phonemes) for unfamiliar words. Besides that, for autism children, it is important to avoid large noisy situation, as it can cause anxiety and panic. By keeping the unpredictable situation to the children daily life it is more possible to pronounce the words better.

References

- Carrow, Woolfolk, E. & Lynch, JI. 1982. Integrative Approach to Language in Children. New York: Grune & Straon,
- Cummings, L. 2005. Pragmatics: A multidisciplinary perspective. Edinburgh, UK: Edinburgh University Press.//2009
- Dalley JW. at all. Cognitive sequelae of intravenous amphetamine self-administration in rats: Evidence for selective effects on attentional performance. Neuropsychopharmacology. 2005; 30 (3)525-537.

Dardjowidjojo, Soejono. 2003. Psikolinguistik. Jakarta: Yayasan obor Indonesia.

Dodd, B. and Iacono, T. 1989: Phonological disorders in children: Changes in phonological process use during treatment. *British Journal of Communication Disorders* **24**, 333–51

Grunwell, P., 1987, *Clinical Phonology, Second Edition*. (London: Chapman & Hall) Hadis, Abdul. 2006. *Pendidikan Anak Kebutuhan Khusus: Autistik*. Bandung: Alfabeta

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- Hodson, B. W. (2009). Enhancing phonological patterns to expedite intelligibility gains. In C. Bowen, *Children's speech sound disorders*. Oxford: Wiley-Blackwell, pp. 19-2
- Rapin, I., & Allen, D. (1983). Developmental language disorders: nosologic considerations. In U. Kirk (Ed.), Neuropsychology of language, reading, and spelling (pp. 155–184). New York: Academic Press.

https://www.psychiatry.org/psychiatrists/.../dsm

http://www.republika.co.id/berita/nasional/umum/13/04/09/mkz2un

http://mypapirus- papirus.blogspot.com/2009/06/autisme-psikolinguistik.html

epwww.psych.ox.ac.uk/oscci