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Overarticulator on Contoid [r] Indonesian Deaf Children

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Abstract

This research aims at describing overartikulator contoid [r] deaf children Indonesia. This research uses qualitative descriptive method. Data researched is overartikulator contoid [r] deaf children. The source of data is the son of deaf SLB-B on kindergarten groups A hearing impairment bit heavy. Data collection is done with the data source mimicked speech researcher and teacher or when pronouncing vocabulary list Containing contoid [r]. The collection of data using techniques of natural observation, observation, participation, of a scheduled Fishing fishing substitution, recording, record-keeping and field. Penganalisisan data using the method in accordance with the technique of determining element is broken. Based on data analysis, contoid [r] resulting in two groups of deaf children. The Union, contoid [r] generated anyway. **[r], [**★r★r], [αrer], [rr], [l], [ll], [★l], [l★], and [et]. Second, contoid [r] produced change. In two of the group, contoid [r] created by [r], [The results contain the differences distinguishing characteristic on the basis of the representation and the representation of contoid phonetic [r]. In the difference that happens overarticulator contoid [r] which does not occur on other contoid. From overartikulator it changes the sounds anaptiksis, reduplication, and contoid attenuation [r].

Keywords: overartikulator, contoid, basic phonetic representation, representation, sound changes

1. Introduction

Kontoid [r] is a sound alveolar vibrate. The pronunciation [r] of the pronunciation consists of rapid repetition or basic articulation. Contoid [r] articulated the tip of the tongue touches the gums for a while, then is released then touches the gums for a while, then touches the gums for a while, then released again, then touches again, and so on. Contoid [r] is produced by the flow of air released through the left and right sides of the tongue and then vibrated. In this case, the tip of the tongue tip is the articulator and the arch of the tooth is the point of articulation. Verhaar (2010: 37) assumes that the contoid [r] is a mixture of fricative contoid bursts. In the Indonesian language, contoid [r] contains one clear pronunciation, namely [r], as in the roti [r□ti], lari [lari], and ular [ular]. In contrast to Indonesian, contoid

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[r] in English (British) is pronounced varied ie fixed [r] and disappear or fade. Kontoid [r] is pronounced still [r] if it is before the vocoid, it will stay if it is after the vocoid [1] as in red [r□d], route [ru:t], car [ka], four [f□]. The pronunciation phenomenon shows the uniqueness of the contoid [r].

This article discusses the overarticulator of Indonesian deaf children. The purpose of this discussion is to describe the contoid overarticulator [r] that occurs in Indonesian deaf children.

At a glance, a deaf child (ATr) is no different from a child who is deaf. Someone will know that a child has a hearing impairment and a hearing impairment when the child is talking. Deaf children speak in a language that is less or unclear. In communicating with their environment, deaf children use sign language more, while deaf children in their environment use spoken language more than sign language.

Deaf children have limitations in terms of language. Sastrawinata [2] said that the limitations of deaf children in terms of language are (1) poor in vocabulary, (2) it is difficult to interpret or understand language expressions that contain figurative meanings, (3) it is difficult to interpret or understand abstract words, (4)) lack of mastery of rhythm and style of language. Cruickshank (1980: 8) said that the salient features that were limited by deaf children were (1) difficulty in adjusting language sounds, (2) monotonous sound quality, (3) and poor articulation. Somad and Hernawati [3] also explained that another weakness when reading the ATr utterance was the similarity between various forms of sound, for example, bilabial sounds [p], [b], and [m] with dental sounds [t], [d], and [n]. As a result, children with hearing impairment will have difficulty in distinguishing the form of the sound spoken by the speaker.

Hudgins and Numbers [4] conducted a study by analyzing the utter 192 ATr heavy and very heavy. In that study, Hudgins and Numbers [4] found two things. First, there were deficiencies in the speech of children concerning rhythm, beheading of phrases, the sound of language was rather monotonous and not expressive, and could not produce the color of language sounds. Second, various articulation errors are found in certain speech sounds (vocal articulation errors are usually more frequent than consonants).

Sardjono [5] explains that (1) ATr has difficulty adjusting the volume of sound produced, ie the sound produced by the utterance does not correspond to the energy expended (for example I aku [□:ku:], (2) speaking is audible intermittent, namely the reduction of initial and middle syllables (for example, tuti [□t□] or [t□]), (3) the formation of words in spoken language is not good, that is, the sound patterns are incorrect (because ATr is unable to control the truth and errors in the pronunciation of words). With these errors and shortcomings, there is the uniqueness of the Indonesian phonological system deaf child, especially the overarticulator peculiarity in producing contoid [r].

Overarticulator consists of the words over and articulator. Over means, something that exceeds the capacity and articulator means a tool that can be moved freely. Kontoid overarticulator [r] means the use of excessive articulators in producing contoid [r].

2. Literature Review

2.1. Language Sound Production

When the air flows out, the vocal cords are open. If the air does not experience obstacles when speaking, language sounds will not occur, as in breathing [6].

In producing language sounds, utterances in the oral cavity involve two articulators, namely active and passive articulators [7]. Active articulators are speech devices that move or are moved, whereas passive articulators are speech devices that cannot move. Active articulators usually move between positions to determine the point of articulation to produce language sounds. Radford et al. [8] said that the organs involved in the process of language production are the lungs, throat (trachea), larynx (larynx), pharynx (pharynx), language vocal cords, oral cavity, nasal cavity (nasal cavity), tongue (tongue), and lips (lips). Organs can be grouped into three main parts, namely (1) vocal tracts that begin at the beginning of the vocal cords or glottis, and end at the lips, (2) nasal tracts from velum to the nostril, and (3) source generators consisting of lungs, throat, and larynx.

Thus, the process of producing language sounds in humans can be divided into three physiological processes, namely (1) formation of airflow from the lungs, (2) changes in the flow of air from the lungs into language sounds, both voiced, and unvoiced, known as the term phonation, and (3) articulation, namely the process of modulation/regulation of language sounds into specific sounds.

2.2 Deaf Children

Hallahan and Kauffman [9] provide a limitation that a deaf person (a deaf person) is a child who has a hearing disability, thus experiencing obstacles in processing linguistic information through hearing with or without using hearing aids. Thus, children with hearing impairment are children who experience a deficiency or loss of ability to hear, either partially or completely, caused by the malfunction of some or all hearing devices, so that they cannot use their hearing devices in daily life properly.

Deaf children are children who have hearing loss. The disorder has varying degrees. Based on measurements with an ISO (International Standard Organization) audiometer, Soepardi et. al. [10] divide the degree of yellowing consisting of 25dB –40 dB, 41 dB - 55 dB, 56 dB - 70 dB, 71 dB - 80 dB, and 90 to the top. Degrees of yellowness at the same time indicate the category, namely the degree 25dB –40 dB indicates the category of hearing impairment is very mild, degrees 41 dB - 55 dB indicate the category of moderate hearing impairment, degrees 56 dB - 70 dB indicates the category of moderate deaf weight, degrees 71 dB - 80 dB indicates the category weight, and degrees 90 and above indicate the very heavy category.

Illiteracy has wide and complex impacts on children and families, and even impacts on community attitudes. Illiteracy raises a broad impact that will be a disruption in the life of the person concerned. Boothroyd explains that ambiguity influences auditive perception problems, language and communication problems, intellectual and cognitive problems, educational problems, social problems, emotional problems, and even vocational problems [11].

As a result of hearing loss, hearing impaired children do not function as they should. as a result, the hearing acuity of the deaf child is reduced so that the perception of hearing is less developed. deaf children often find it difficult to hear the sounds of language and cannot repeat words until they become language through hearing. Ling argues that ambiguity has a core impact on the person concerned, namely language disturbances or obstacles. Thus, deaf children experience verbal communication disorders [12].

3. Research Methods

This study used descriptive qualitative method. The data studied is the Indonesian phonological system of deaf children, with a focus on overarticulator [r] of Indonesian deaf children. The data source is deaf children who attend SLB B in kindergarten group A with a rather heavy salary.

Data collection was carried out when the data source went to SLB B kindergarten group A in April, May, and June 2019 or the 10th, 11th, 12th school year 2018-2019. Data collection is carried out by imitation, ie the researcher or teacher pronounces vocoid and contoid in the vocabulary list then the source of the data imitates it. Therefore, data collection uses natural observation techniques, participatory observation techniques, scheduled fishing techniques, substitution fishing techniques, recording techniques, and recording techniques. Data collection procedures performed include filling in the identity of the data source, participant observation, and non-participant observation, recording, field recording, phonetic transcription, validation of the data collected. Data collection instruments used were vocabulary lists, audio-video recorders, headphones.

Analyzing data uses qualitative descriptive analysis techniques with a generative phonological approach. The procedures include sorting data, classifying data, reducing data, presenting data, describing data, interpreting generative phonological data, concluding, and ending research. The data analysis instrument used in this study was the Fonologis Rule.

4. Research Results

Kontoid [r] in generative phonology is distinguished + consonantal, + continue, + vibrate, + alveolar, + voiceless, + glide. In this research, the following data are obtained as [oid].

1. bibir [bibir]_biilbil [biilbi]
2. akar [akar]_aa ★r ★r [aa ★r ★r]
3. raka [raka]_ eelala [∴∴lala]
4. air [aer]_ ararer [ararer]
5. leher [l☜h☜r]_ laaheet [laaheet]

In data 1 to 5, the word to the left of the arrow (_) shows gloss and to the right shows the change in the speech that occurs at ATr. In other words, the one to the left of the arrow is the basic representation of the contoid [r] while to the right of it is the phonetic representation of ATr.

The order of the rules in deriving the basic representation into the phonetic representation of data number (1) is normalized with the following order of rules.

1. a. Basic representation of lips [bibIr]

Sort rule		
a) vocoid stronger	*[I]_[i]*	*[bibir]*
b) softening of the contoid	*[r]_[l]*	*[bibil]*
c) vocoid dimming [i] becomes second silly		[biibil]
d) insertion of the [l] contoid into the second silly code		[biilbil]
Phonetic representation		[biilbil]

1. b. Representative based [bibIr]

Sort rule		
a) vocoid stronger	*[I]_[i]*	*[bibir]*
b) softening of the kontoid	*[r]_[l]*	*[bibil]*
c) insertion of the [1] contoid of the silod code		[bilbil]
d) Vocaloid dimming [i] as the second silent of onset		[biilbil]
Phonetic representation		[biilbil]

Data number 1.a dan 1.b illustrates the decrease in the representation of *bibi [bibIr] _ biilbil[biilbil]*. The phonetic representation of *biilbil[biilbil]* from the representations of *bibir [bibIr]* is unique. The phonetic representation of *biilbil[biilbil]* is only found in the utterance ATr. The existence of sound [i] in syllable *bi [bi] _bi-i [bi-i]* and the presence of sound [l] in syllable *bi-il [bi-il]* are understood to contain multiple phonological processes, namely as an insertion or reduplication process. Understood as insertion because before it did not exist then it became [i]. It was understood as reduplication because in front of it there was an estimated [i] that was repeated. Meanwhile, in Yulianto (2009: 57), it is stated that the rules that insert a vocoid between a contoid are more natural than those that insert a contoid in the environment. Based on that statement, the vocoid [i] in the syllable *bi-i [bi-i]* is an insertion. However, based on previously existing [i], it is estimated as reduplication.

Comparable to *bibir [bibir]*, *_biilbil [biilbil]* is the basic representation of *bubur [bubUr] buburer [bubur∴r]* and *bubulel[bubulel]*. In the reduction of *bubur [bubUr]*; *[bubur∴r]* and *bubulel[bubulel]* it is estimated to contain alternative representations between the following.

a. A basic representation of bubru		[bubUr]
Rule order:		
a) vocoid reinforcement	*[U]_[u]*	*[bubur]*
b) contraceptive copying [r]		[buburr]
c) insertion of the vocoid transmitter [∴] between the contoid [r]		[bubur]

Phonetic representation [bubur∴r]

b. Basic representation of *bubur* [bubUr]
Rule order:
a) vocoid reinforcement *[U]_[u]* *[bubur]*
b) addition of the vocoid transmitter [∴] at the end [bubur]
c) addition of contoid [r] at the end [bubur∴r]

Phonetic representation [bubur∴r]

c. A basic representation of *bubur* [bubUr]
Rule order:
a) vocoid reinforcement *[U]_[u]* *[bubur]*
b) contoid weakness *[r]_[l]* *[bubul]*
c) addition of syllable [∴l] as final code [bubulel]

Phonetic representation [bubul∴l]

d. A basic representation of *bubur* [bubUr]
Rule order:
a) vocoid reinforcement *[U]_[u]* *[bubur]*
b) contoid weakness *[r]_[l]* *[bubul]*
c) addition of vocoid [«] at the end [bubul∴]
d) addition of contoid [l] as the final code [bubul∴l]

Phonetic representation [bubul∴l]

Based on the alternative sequence of representations between the above, the decrease in *bubur [bubUr]*; *buburer [bubur∴r]*, and *bubulel[bubul∴l]* is unique. In the lips of *[bibIr]*; *biilbil [biilbil]*, it is understood to have a dual phonological process, namely the presence of [i] and [l] in the initial syllables. In *bubur [bubUr]*; *buburer [bubur∴r]*, it is understood to have a double phonological process, namely the presence of *er [∴r]* in the final syllable. It is understood to have a double phonological process, namely the presence of the sounder [∴r] in the *bubur [bubUr] [buburer [bubur∴r]* because it is considered to be a unit of sound *[∴] + [r]* and the syllable *er [∴r]*. The same assumption occurs in [∴l] in *bubulel[bubul∴l]*.

The order of the rules in descending the basic representation into the phonetic representation of the number (2) is normalized with the following order of rules.

2. a. Basic representation of the contoid [akar]
Rule order
a) contoid impregnation [k] [aar]
b) vocoid insertion [\] [aa∴r]
c) contraceptive copying [r] [aa∴rr]

Phonetic representation [aa∴rr]

2. b. Representation of the basic contoid [akar]
Rule order
a) contraceptive copying [r] [akarr]
b) contoid impregnation [k] [aarr]
c) inserting vocoid [«] between vocoid [a] [aa∴rr]

Phonetic representation	[aa∴rr]

2. c. Representation of the basic contoid	[akar]
Rule order	
a) vocoid insertion [∴]	[aka∴r]
b) contoid absorption of [k]	[aa∴r]
c) contraceptive copying [r]	[aa∴rr]
Phonetic representation	[aa∴rr]

Data number 2.a dan 2.b uses the descending representation of base akar[akar] to represent the phonetic representation aaerr[aa«rr]. The phonetic representations of the [rr] of the representations of the roots [root] are unique. The phonetic representation of aaerr[aa«rr] from the representation of the root [root] is only found in the utterance ATr. Another uniqueness is the presence of contoid leakage [k] in the middle, insertion of a vocoid [«], and dimming of the contoid [r] at the end. In a decrease akar[akar] _aaerr [aa«rr] is thought to contain multiple phonological processes. The existence of [«rr] in the final code is formed through an alternative sequence [«] + [r] + [r] or [«r] + [r]. This assumption is raised because in other parts there are agar [asarr] [aarr], and asar[asar] _acar [pickle]. In that assumption, vocoid [«] is considered to be concentrated first in the final code [«r] then followed by [r] or vice versa.

The order of the rules in descending the basic representation into the phonetic representation of the number (3) is normalized with the following order of rules.

3.a. Basic representation of *raka*	*[raka]*
Rule order	
a) weakening of the contoid *[r]_[l]*	*[lαkα]*
b) weakening of the *[k]_[l]*	*[lαlα]*
c) addition of the [∴] transmitter sound at the beginning of	*[∴lαlα]*
d) duplicating sound transmitter [∴] initial	[∴∴lala]
Phonetic representation	*[∴∴lala]*

3. b. Basic representations of *raka*	*[raka]*
Rule order	
a) attenuation of the *[k]_[l]*	*[rαlα]*
b) weakening of the contoid *[r]_[l]*	*[lαlα]*
c) addition of sounding *[∴]*	*[∴lαlα]*
d) duplicating the sound of the transmitter *[∴]*	*[∴∴lαlα]*
Phonetic representation	*[∴∴lαlα]*

Data number 3.a dan 3.b uses the descending representation of basic raka[raka] to represent phonetic representation of *eelala[∴∴lala]*. The phonetic representation of *eelala[∴∴lala]* in the representations of *raka[raka]* is unique. The phonetic representation of *eelala[∴∴lala]* is only in the spoken language ATr. The existence of the sound *[e-e]* in the syllable *e-e [e-e]* is understood to contain a dual phonological process, that is, the second [e] is the insertion or reduplication.

Comparable to *raka[raka]*; *eelala[eelala]*, the basic representation of bodies [raga]; elaya [∴laya], *elada[∴lada]* and *elala[lala]*. In the decline there is a phonological process of adding the sound of the transmitter [∴] in the beginning to precede pronunciation, attenuation of the [r]; [l] Contempo, the velar contingent advance which also occurs in *raka[raka]; eelala [∴∴lala]*. The difference is that, in the body []], *[laya]; [∴laya]*, *eelada[∴lada]* and *elala[lala]* do not duplicate [∴]. and d].

The order of the rules in descending the basic representation into phonetic representation of number (4) is normalized with the following order of rules.

4. a. Water base representation	[aIr]
Rule order	
a) vocoid attenuation *[I]_[e]*	*[œr]*
b) vocoid dimuplication [a]	[aaer]
c) contoid duplicating [r]	[aaerr]
d) vocoid metering [e] becomes the final syllable	[aarer]
e) insertion of a contoid [r] between the voidoid [a]	[ararer]
Phonetic representation	[ararer]

4. b. Water base representation	[aIr]
Rule order	
a) vocoid attenuation *[I]_[e]*	*[œɛr]*
b) vocoid metering [e] becomes koda	[are]
c) addition of [r] contoid to koda	[arer]
d) vocoid complication [a] in the beginning	[aarer]
e) insertion of a contoid [r] between the vocoid [a]	[ararer]
Phonetic representation	[ararer]

Data number 4.a dan 4.b uses a decrease in representational representation to become a phonetic aromatic representation [ararer]. The phonetic representations of *ararerr [ararer]* from the representations of *air [aIr]* are unique. Its uniqueness is seen that the coronary phonetic representation [ararer] is only found in the ATr utterance. The phonological process in the phonetic representation of the *ararer[ararer*] is thought to consist of the order of the initial vocoid [a] duplicate sequence, the vocoid [e] metathesis, the contoid demolition [r] and the contoid insertion [r]. The order of the rules is considered to contain multiple phonological processes, namely the existence of [a] and [r] in the middle interpreted as insertion or reduplication.

Comparable to *air [aIr]*,*ararer [ararer]*, the basic representations of *are [ar∴]* decrease to phonetic representations of *aael[aa∴l]* and *arerer[arerer]*. In decreasing *are [ar∴] aelaael[aa∴l*] there is a phonological process in the form of the addition of vocoid [a] and vocoid [∴] metathesis with contoid [l]. The presence of vocoid [a] in the initial syllables can be understood as a double phonological process, namely vocoid reduction [a] or vocoid insertion [a]. In decreasing the are [ar«] _arerer [arerer] it is estimated that the phonological process is added at the end, namely [rer]. The process is considered to be double, namely [r] + [er] or [rer], as is the case in ararer phonetic representations [ararer].

The order of the rules in descending the basic representation into phonetic representation of the number (5) is normalized with the following order of rules.

5. a. Representation of the base of the neck	*[l ☜h ☜r]*
Rule order	
a) contour inhibition *[r]_[t]*	*[l ☜h ☜t]*
b) vocoid attenuation *[☜]_[a]*	*[lɑh ☜t]*
c) vocoid attenuation *[☜]_[e]*	*[lɑhet]*
d) vocoid reductions [a]	[laahet]
e) vocoid dimming [e]	[laaheet]
Phonetic representation	[laaheet]

5. b. Representation of the base of the *leher*	*[l ☜h ☜r]*
Rule order	
a) vocoid attenuation *[☜]_[a]*	*[lah ☜r]*

b) vocoid attenuation *[☜]_[e]*	*[lɑher]*
c) contour inhibition [r] *[r]_[t]*	*[lɑhet]*
d) vocoid reductions [a]	[laahet]
e) vocoid dimming [e]	[laaheet]
Phonetic representation	[laaheet]

Data number 5.a dan 5.b uses the decrease in representation of the form to represent the phonetic laaheet[laaheet]. Phonetic representation of laaheet[laaheet] from representing basic leher *[l ☜h ☜r];* leher *[l ☜h ☜r]* is unique. The phonetic representation of laaheet[laaheet] is only found in the ATr utterance. Sound reduction in the form of vocoid dimes [a] and vocoid dimes [e] are phonological processes that are interpreted double. The process is interpreted as reduplication and insertion. That is, the presence of voids [a] and [e] is interpreted as a phonological process of reduplication and insertion.

Comparable to ahlaaheet[laaheet], the basic representation was *lahir [lahIr]*, enlaela [∴nlaela] and laela[laela]. In birth reduction [enIela][enlaela[∴nlaela] there is a phonological process of adding [«n] in the beginning, permeating the contoid [h], inserting the vocoid [∴], weakening the contoid [r] _[l]], and adding a vocoid [a]] at the end. In the birth decline [laIr] _ laela[laela] phonological processes occur in the contraceptive impregnation [h], insertion of emitting sounds [∴], attenuation of the contoid [r] _ [l], and the addition of voidids[a]] at the end. Also comparable to ahlaaheet[laaheet] is the sublime decline of [luhUr] _lulurr [lulurr]. In the decrease in sublime [luhUr] _lulurr [lulurr] there is a phonological process of weakening of the contoid [h] _[l], strengthening the vocoid [U] _ [u], and reducing the contoid [r] at the end.

From that description, the phonological processes that occur in the birth reduction [lahIr] _enlaela [«nlaela] and laela[laela] and the sublime [luhUr] _lulurr [lulurr] look different from those that occur in the decreasing in *leher [l ☜h ☜r]*, *laaheet [laaheet]* although the basic representation contains the same initial, middle, and final contoid. In the decrease in *leher[l ☜h ☜r]* _laaheet [laaheet] there is a phonological process of vocoid weakening [☜] _ [a], vocoid weakening [☜]_[e], contoid inhibition [r] _ [t], vocoid reduction [a], vocoid reduction [e]. In birth reduction [enIela] _enlaela[∴nlaela] there is a phonological process of adding [«n] in the beginning, permeating the contoid [h], inserting the vocoid [∴], weakening the contoid [r] _ [l]], and adding the vocoid [a]] at the end; born [lahIr] _laela[laela] phonological processes occur with contraceptive impregnation [h], insertion of emitting sounds [∴, attenuation of contoid [r] _ [l], and the addition of voids [a] at the end. In the decrease in sublime [luhUr] _lulurr [lulurr] there is a phonological process of weakening of the contoid [h] _ [l], strengthening the voidoid[U] _ [u], and reducing the contoid [r] at the end.

With regard to decreasing the basic representation of contoid [r] to phonetic representation, such as on the *bibir [bibir]*; biilbil[biilbi], akar[akar], aa∴r∴r [aa ∴r∴r], *raka[raka]*; *eelala[∴∴lala]*, *air [aer]* _ararer[ararer], leher *[l ☜h ☜r]* _laaheet[laaheet], deaf child speech tends to be unclear. In other words, the phonetic representation is not found in the Big Indonesian Dictionary. Linguistically, such phonetic representations are considered to contain phonological deviations (Yulianto, 2009: 57). Simanjuntak (1990b: 72) calls it a deviant phonologist.

5. Conclusions

Based on the results of this study, the decrease in the contoid basic representation [r] in ATr consists of two groups. In the first group, the decrease in the contoid basic representation [r] becomes a fixed phonetic representation [r]. The second group, decreases in the contoid basic representation [r] into phonetic representations [rr], [rer], [∴r∴r], [ela]. Decreasing the contoid basic representation [r] to phonetic representations [rr], [rer], [∴r∴r], [ela] in ATr in the second group reflects the existence of over articulation contoid [r]. In over articulation, contoid [r] is articulated with an articulator that vibrates excessively. The vibration should be once, but several times.

References

[1] Anami, M. (1985). Differences in the distribution betwen Arabic [l], [r] and English [l], [r]. *Papers and Studies in Contrastive Linguistics*, 20. 129-33.
[2] Sastrawinata, Emon. 1979. *Pendidikan anak-anak tunarungu*. Jakarta: Depdikbud.

[3] Somad, P. dan Titi Hernawati. (1996). *Ortopedagogik anak tunarungu*. Jakarta: Dikti Depdikbud.
[4] Hudgins, C. V., & Numbers, F. C. (*1942*). An investigation of the intelligibility of the speech of the deaf. Genetic Psychology Monographs, 25, 289–392.
[5] Sardjono (2005), Terapi Wicara. Jakarta: Departemen Pendidikan Nasinal-Direktorat Jenderal Pendidikan Tinggi-Direktorat Pembinaan Pendidikan Tenaga Kependidikan Dan Ketenagaan Perguruan Tinggi.
[6] Pike, Kenneth L. (1947). *Phonemics a technique for reducing languages to writing*. Ann Arbor: University of Michigan Press.
[7] Chaer, Abdul. (2009). *Fonologi bahasa Indonesia*. Jakarta: Rineke Cipta.
[8] Radford, Andrew, et.al. (2009). *Linguistics an introduction* (second edition). New York: Cambridge University Press.
[9] Hallahan, D. P. dan Kauffman, J. M. (1991). *Exceptionality childern introduction tospecial education* (fifth ed.). New Jersey: Prentice Hall International, Inc.
[10] Soepardi, Efisty Arsyad, et.al. (2007). *Buku ajar ilmu kesehatan telinga, hidung, tenggorok, kepala & leher.* Jakarta: FK Universitas Indonesia.
[11] Boothroyd, Arthur. (1982). *Hearing Impairments in young children*. New Jersey: Prentice Hall Engle Wood Cliffs.
[12] Ling, Daniel. (1976). *Speech and the hearing impaired child. theory and practic*.