Phonological Processes in A 18-Months Bilingual Toddler

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Abstract:
The toddler’s first words were unintelligible speech by adult. This study was conducted to investigate the language development undergone by a 18-months bilingual toddler. The study of language development had two perspectives in terms of clinical and linguistic perspective. This study was a linguistic perspective to find out the language development processes especially in phonological processes undergone by a 18-months bilingual toddler. This study employed descriptive case study as the method with observation and video recording as the data collection. The participant of this study was a 18-months Javanesse-Indonesian toddler. The data were collected for 30 days. The data were categorized and analyzed based on Ingram's theory (1976). The result revealed that there were three categories of phonological processes undergone by 18-months Javanesse-Indonesian toddler such as substitution, assimilatory, and syllable structure processes. The syllable structure processes with initial consonant deletion is the most dominant types of phonological processes. The results are expected to enrich the study of language development especially in a 18-months Javanesse-Indonesian toddler in which the information will benefit for the practicing clinicians.

Keywords: Bilingualism, Javanesse-Indonesian, Language development, Phonological processes, Toddler
1. Introduction

Language is considered as one of communication tools by human beings. Human beings especially adults communicate with world by means of a language that can be understood by others. However, children communicate by means of language that is sometimes hard to be understood by adults. Therefore, the process of language development in human beings especially in earlier period of children is interesting. Ingram (1989) also reported that when a child begins to expand inventory of speech sounds. They would experience phonological processes that lead in incorrect productions. These processes predominate in language development until around the ages of 4. The stages can be categorized into (1) Prelinguistic vocalization and perception (birth to 1;0); (2) Phonology of the first 50 words (1;0-1;6); and (3) Phonology of single morphemes (1;6-4;0).

There are two major perspectives in learning the language development, medical and linguistic perspective. The medical perspective is a longer history of perspective used by speech-language pathologist to explain and to identify the cause of speech impairments of organic problems such as cleft palate. This perspective will benefit speech-language pathologist to do the possibility of medical intervention. The other perspective is linguistic perspective. This perspective is also crucial in language development by providing the theories about the understanding of phonological developments and impairments in children. Both these perspectives are complement one another because medical perspective will deal with the integrity of neuroanatomical system; and the linguistic perspective will provide description of language system development occurred in children (Baker, Croot, McLeod, & Paul, 2001).

This study focuses on the linguistic perspective of language development. The study is limited on the phonological processes in a child. Bankson & Bernthal (1990, as cited in Bernthal, Bankson, & Flipsen, 2016) defined the phonological processes as a simplification of a sound class in which targeted sounds are systematically deleted or substituted. The phonological processes are chosen because in earlier period of producing sounds, a child will produce unintelligible speech by simplification of the sounds.

There are some previous studies about the phonological processes; and the common studies are in children above 3 years old. James, van Doorn, McLeod, & Esterman (2008) found that monolingual children speaking Australian English between 3 – 7 years mostly used consonant deletion; and there is also relationship between the frequency of deletion and the number of syllables in words. James, Ferguson, & Butcher (2016) also found there are 16 phonological processes undergone by Australian English between 3 – 7 years. Cleland et al., (2017) conducted a study about the error in persistent velar fronting occurred in children at ages of 6 – 10 years. Fabiano-Smith & Cuzner (2018) investigated the initial consonant deletion in bilingual children at average ages of 4 years; and revealed that complexity of syllable type does not motivate initial consonant deletion. However, there is still limited study in children under 3 years old. Claessen et al., (2017) state it is possible to identify 2 years old children because they have a relatively stable phonological system. The
example of the study under 2 years old is conducted by Adnyani & Pastika (2016) towards an Indonesia-German child between the ages of 12 – 20 months.

Therefore, this study is conducted in a child under 3 years old. In addition, there have been limited studies concerned on the language development especially in phonological processes encountered by Javanese-Indonesian toddler at ages of 18 months. This study is conducted to find out what types of phonological processes occurred in a 18-months of Javanese-Indonesia toddler. The results of the study, theoretically, are expected to enrich the language development especially in phonological processes with ages of 18-months Javanese-Indonesian toddler. This information will benefit for practicing clinicians. In addition, practically, by knowing the types of phonological processes, it would help parents to understand the speaking of their children better.

2. Literature Review

2.1 Language Development

Lauwers & Swisher (2011) states that as soon as babies are born; they will cry. They may cry to indicate hunger, pain, or reaction to their environments. Crying is considered as means of communication even though this language is not easily understood (Liu, Li, Wu, & Zhou, 2019). Although, babies cannot speak words like an adult; they can communicate and ready to respond to human voice (Ashford et al., 2018). After that moments, infants will learn to communicate. They communicate with worlds by means of gesturing their hands, bodies, face, eyes, approaching and touching other, making noise and vocalizing (Liszkowski, 2014). Before they speak words, they will explore their vocal apparatus communicatively in prelinguistics vocalization. They will begin to produce more primitive sounds which are called protophones as the precursors to speech rather than targeting vowels, consonants, words, or phrases (Jhang & Oller, 2017). The sounds produced are quite different from the phonemes of speech relative to adults because their vocal tracts are different in shapes and size; and they are also unable to control their lounge, lips, and jaw in the same manner as adults (Stark, 1978).

The first sounds produced by infants are soft vowel sounds like dove cooing (Levine & Munsch, 2016). They begin to coo or make sounds such as “Ahhhh” or “Ohhhh” (Ashford et al., 2018). And between 6 and 8 months, infants begin to babble a single syllable repeated such as, bababa-mamama, mememe-dede, baba-dadada (Clark, 2009). At this point, parents are very excited because they considered “dada” refers to “daddy”; and “mama” refers to “mommy” (Levine & Munsch, 2016). Babbling sometimes leads to infant’s first words; and they learn to understand words between 9 and 15 months of age when infants develop a capacity for interpreting others’ goals and intentions (Bergelson & Swingley, 2012).

2.2 Phonological Processes

Ingram (1976) categorizes phonological processes into three, substitution, assimilatory, and syllable structure processes. The first is substitution processes. These processes result in the replacement of one segment by another. There are five
commons of substitution processes undergone by children such as (1) stopping, (2) fronting, (3) gliding, (4) vocalization, and (5) vowel neutralization. The second is assimilatory processes. These processes are tendencies to assimilate one segment in another words. There are three common assimilatory processes in children such as (1) voicing, (2) consonant harmony, and (3) progressive vowel assimilation. The third is syllable structure processes. These processes are tendencies by children to simplify syllable structure. There are four basic syllable structure processes in children such as (1) cluster reduction, (2) deletion of final consonant, (3) deletion of weak syllable, and (4) reduplication.

3. Methodology

This study employed descriptive case study as the method. The case study is chosen because the focus of this study is to understand the naturalistic setting or certain phenomena of person in everyday life.

3.1 Participant

The participant of this study is the researcher’s nephew. His name is Rafanda with Rafa as his nickname. He is a toddler with 18 months of ages. He is a normal toddler without physical disability. He was born in bilingual family. His parents native to Javanese and Indonesian language. They usually communicate with both language to his son interchangeably. Therefore, sometimes Rafanda speaks in Javanese or Indonesian language.

3.2 Instruments

The data are collected by means of video recorder and observation. However, there are challenges when collecting the data. At this age, the vocabulary of the participant is still limited; and he often produces words that are hardly to be understood by the researcher or people around. He also sometimes prefers to use gesture when communicating or asking something rather than speaking the vocabulary. Therefore, when collecting the data, it is helped by his babysitter. The babysitter will invite the participant to communicate such as by asking “what is the color of his clothe?” etc. This conversation is recorded by video recorder. The data are collected for 30 days.

3.3 Data Analysis

There are several steps in analyzing the data. First the video will be transcribed. Second, the sounds that are unclear such as toddler’s babbling will be eliminated. And third, the data will be analyzed and categorized based on the phonological processes proposed by Ingram (1976).

4. Result and Discussion

The result reveals that when Rafanda, a 18-months Javanese-Indonesian toddler, is speaking; there is a simplification of his vocabulary. The simplification can be categorized into three categories, substitution, assimilatory, and syllable structure processes based on Ingram's theory (1976). These processes are explained bellow.
4.1 Substitution Processes

The first process is substitution processes. These processes occur when there is a substitution of one segment to another segment. The substitution processes undergone by Rafanda are two types, stopping and fronting. These processes are the common pattern of phonological processes occurred in children’s speech (Ingram, 1976). These innate processes occur as the representation of constraints in which a child will produce the simplest pronunciation patterns in the early stages of phonological development by modifying or suppressing in order to learn more advanced form or adult realization of the sound in the process of mastering spoken language (Bowen, 2015).

4.1.1 Stopping Processes

The first process is stopping process. This process is the common pattern and becomes more established patterns in children’s speech. This process affects the fricative group of sounds, although occasionally will affect the resonant group of sounds (Ingram, 1976). Based on the result, the stopping processes only affect the fricative sounds undergone by Rafanda, as can be seen in Table 1.

| No | Language | Glossary        | Adult Target | Child Production | Phonological process |
|----|----------|-----------------|--------------|------------------|---------------------|
| 1. | Indonesian | Susu (Milk)    | [susu]       | [cucu]           | Stopping            |
| 2. | Indonesian | Foto (Photo)   | [foto]       | [coto]           | Stopping            |

Based on the Table 1, there are two words containing phonological processes by stopping process. The first word is for Susu (milk). Rafanda pronounced [cucu] instead of [susu] when he asked a bottle of milk to his babysitter. He pronounced the consonant of voiceless alveolar fricative /s/ by replacing with voiced palatal plosive /c/. This pattern is also found in a 20-months Indonesian-German bilingual child in research conducted by Adnyani & Pastika (2016). They found that the 20-months Indonesian-German bilingual child pronounced [cana] instead of [sana] (there). The second word is for Foto (Photo). The babysitter initiated to take a photo of Rafanda; and she shouted “Foto, Foto, Foto”; and Rafanda repeated by [coto] instead of [foto]. He pronounced the voiceless labiodental fricative /f/ by replacing with voiced palatal plosive /c/.

The two words above indicate that Rafanda tends to substitute the voiced palatal plosive /c/ for the fricatives such as voiceless alveolar fricative /s/ and voiceless labiodental fricative /f/. These substitution processes are systemic and applied in the same context each time that sound occurs. These processes are in line with the Jakobson’s law and prediction (1941, as cited in Ingram, 1989). He proposed a law of irreversible solidarity that the existence of fricatives implies the existence of stops; and a predication in language acquisition that stops are acquired before fricatives. However, these processes will be systematically eliminated at predictable age in a standard development progression. Grunwell (1987, as cited in Alexander, Matthews,
& Murphy, 2015) states that the substitution of the voiced palatal plosive /c/ for the fricatives such as voiceless alveolar fricative /s/ and voiceless labiodental fricative /f/ are gone by approximately at ages of 3 years.

4.1.2 Fronting Processes

The second process of substitution processes is fronting process. This process actually involves two processes, fronting of palatal and fronting of velar which are replaced with alveolar ones (Ingram, 1976). However, there is only fronting of velar found in Rafanda’s speech. In addition Grunwell (1987, as cited in Alexander, Matthews, & Murphy, 2015) states that velar fronting occurs when a velar stop is replaced by an alveolar stop such as /k/ in ‘kiss’ is replaced by /t/; /g/ in ‘give’ is replaced by /d/; and /ŋ/ in ‘wing’ is replaced by /n/. The patterns of voiceless velar plosive /k/ replaced with the voiceless alveolar plosive /t/ and the velar nasal /ŋ/ with the alveolar nasal /n/ are also found in Rafanda’s speech; but for the voiced velar plosive /g/, Rafanda replaced with the voiceless alveolar plosive /t/ instead of the voice alveolar plosive /d/, as can be seen below.

Table 2. Phonological Processes of Fronting by Rafanda

| No | Language | Glossary     | Adult Target | Child Production | Phonological Process |
|----|----------|--------------|--------------|------------------|---------------------|
| 1. | Indonesian | Buka (Open) | [buka]       | [buta]           | Fronting            |
| 2. | Indonesian | Gagah (Manly)| [gagah]      | [tatah]          | Fronting            |
| 3. | Javanese  | Angel (Difficult) | [aŋɛl] | [anel] | Fronting |

Based on the Table 2 above, there are three words containing fronting processes undergone by Rafanda. The first fronting process is for substitution of the voiceless alveolar plosive /t/ for voiceless velar plosive /k/. The example is when Rafanda is asking his babysitter to open a stuff; he pronounced [buta] instead of [buka]. Both the voiceless alveolar plosive /t/ and voiceless velar plosive /k/ are produced by a child with near-identical tongue shapes (Cleland et al., 2017).

The second process is for substitution of the voiceless alveolar plosive /t/ for the voiced velar plosive /g/. The example for the voiced velar plosive /g/ is when the babysitter lauds Rafanda with “[gagah] (manly)”; Rafanda repeated the [gagah] with [tatah]. This result is different from Grunwell’s report (1987, as cited in Alexander, Matthews, & Murphy, 2015) and Adnyani & Pastika’s report (2016) in which the voiced velar plosive /g/ is replaced with voice alveolar plosive /d/ such as gigi (tooth) that is pronounced [didi] instead of [gigi].

The last fronting process is for substituting the alveolar nasal /n/ for the velar nasal /ŋ/. The example is for Javanese language of Angel (difficult). The proper pronunciation should be [aŋɛl]; but Rafanda pronounces [anel]. In line with the report of Smith (1993, as cited in Bernthal, Bankson, & Flipsen, 2016), he reported that this pattern is still common pattern occurred in a child between 2-3 years of ages to replace the velar nasal /ŋ/ with alveolar nasal /n/.
4.2 Assimilatory Processes

The second process of phonological processes is assimilatory processes. These processes occur when there is a tendency to assimilate one segment of words into another segment. These processes are the rarest process occurred in Rafanda’s speech. There is only one type of assimilatory processes, consonant harmony.

4.2.1 Consonant Harmony

This process occurs when the pattern of $C_1VC_2(X)$ syllables consisting of two different consonants experienced assimilatory process of one of the consonant to another consonant in a certain predicted ways with three frequent patterns, velar assimilation, labial assimilation, and denasalization (Ingram, 1976). From the three patterns, there is only one pattern of the consonant harmony, labial assimilation, as can be seen below.

Table 3. Phonological Processes of Consonant Harmony by Rafanda

| No | Language | Glossary | Adult Target | Child Production | Phonological process       |
|----|----------|----------|--------------|------------------|---------------------------|
| 1  | Javanese | Dawah (Fall) | [dawah]      | [wawah]          | Consonant harmony         |

The example of consonant harmony is for [wawah]. Rafanda shouts [wawah] when he is falling. The proper pronunciation should be [dawah], a Javanese language for falling. The consonant harmony above is a type of labial assimilation because the apical consonant of alveolar plosive /d/ tends to assimilate to labial consonant of bilabial glide /w/. The pattern of the [dawah] is $C_1VC_2VC_3$; and it can be seen that the $C_1$ in which the apical consonant of alveolar plosive /d/ experiences a process of assimilating to become labial consonant of bilabial glide /w/. Therefore, Rafanda tends to pronounce [wawah] instead of [dawah]. The process of consonant harmony will be eliminated by a child in approximate age of 3.9 (Bowen, 2015) or 4.0 years (Grunwell, 1987, as cited in Alexander, Matthews, & Murphy, 2015).

4.3 Syllable Structure Processes

The syllable structure processes are motivated by the tendencies of the children to simplify the syllable structure such as cluster reduction, deletion of final consonant, deletion of weak syllable, and reduplication. The cluster reduction is commonly the most dominant syllable structure processes undergone by a child (Ingram, 1976). However, there are only found two types of syllable structure processes undergone by Rafanda with initial consonant deletion as the most dominant process in which the initial consonant deletion does not exist in the Ingram’s theory (1976).

4.3.1 Initial Consonant Deletion

The first type of syllable structure processes is initial consonant deletion. In English language, initial consonant deletion is not attested (Bowen, 2015) for example James, Ferguson, & Butcher (2016) only found final consonant deletion; and there is no initial consonant deletion in Australian English speakers. However, this process is the most dominant process undergone by Rafanda when he is speaking. In addition, Fabiano-
Smith & Cuzner (2018) reports that complexity of syllable type does not motivate initial consonant deletion in bilingual children at average ages of 48 months. They found that the initial consonant deletion occurs in disyllables, trisyllables, and tetrasyllables without affecting the syllable forms. However, Rafanda at ages of 18 months only did initial deletion in disyllables; and there is no initial deletion in words with trisyllables or tetrasyllables. There are ten words containing initial consonant deletion, as can be seen below.

Table 4. Phonological Processes of Initial Consonant Deletion by Rafanda

| No | Language   | Glossary           | Adult Target | Child Production | Phonological process          |
|----|------------|--------------------|--------------|-----------------|-------------------------------|
| 1. | Indonesian | Meong (Mew)        | [meŋ]        | [ɛjoŋ]          | Initial consonant deletion    |
| 2. | Indonesian | Madu (Honey)       | [madu]       | [adu]           | Initial consonant deletion    |
| 3. | Indonesian | Manis (Sweet)      | [manis]      | [ani]           | Initial consonant deletion    |
| 4. | Indonesian | Maem (Eat)         | [maem]       | [aəm]           | Initial consonant deletion    |
| 5. | Indonesian | Permen (Candy)     | [pərmɛn]     | [əmɛn]          | Initial consonant deletion    |
| 6. | Indonesian | Cantik (Beautiful) | [cantiʔ]     | [antiʔ]         | Initial consonant deletion    |
| 7. | Indonesian | Rafa (Name of person) | [rafa]   | [aca]           | Initial consonant deletion    |
| 8. | Indonesian | Rama (Name of person) | [rama]   | [ama]           | Initial consonant deletion    |
| 9. | Javanese   | Wutah (Spill)      | [wutah]      | [utah]          | Initial consonant deletion    |
| 10 | Javanese   | Ngalih (Move)      | [ŋalih]      | [alih]          | Initial consonant deletion    |

Based on the Table 4, there are four words with initial consonant of bilabial nasal /m/. All the words consist of disyllabic syllables; and Rafanda pronounced them with initial consonant deletion of bilabial nasal /m/. For example when Rafanda sees a mew, he shouts [ɛjoŋ]. The proper pronunciation should be [meŋ]. The other example is when Rafanda is drinking a honey; his babysitter asks him what he drinks; and Rafanda answers [adu] in which the proper pronunciation should be [madu]. Besides the initial consonant of bilabial nasal /m/, Rafanda also did initial consonant deletion in the voiceless bilabial plosive /p/ such as in [əmɛn]; the voiced palatal plosive /c/ such as in [antiʔ]; the alveolar trill /r/ such as in [ama]; the bilabial glide /w/ such as in [utah]; and the velar nasal /ŋ/ such as in [alih].

There is also initial consonant deletion followed by other phonological processes. For example, when Rafanda is asked about his name by his babysitter; he answers [aca] instead of [rafa]. There are two processes occurred, initial consonant deletion of the
alveolar trill /r/ and substitution of the voiced palatal plosive /c/ for the voiceless labiodental fricative /f/. This result is in line with the Ingram’s report (1976) that the syllable structure processes often occur with another process such as substitution and assimilatory processes. From the Table 4 above, it can be concluded that the initial consonant deletion only occurred in disyllabic words; and Rafanda faces difficulty to pronounce the consonant in the beginning of words.

4.3.2 Deletion of Weak Syllable

The second type of syllable structure processes is deletion of weak syllable. These processes are the second frequent processes undergone by Rafanda. There are nine words containing deletion of weak syllable, as can be seen below.

Table 5. Phonological Processes of Deletion of Weak Syllable by Rafanda

| No | Language     | Glossary       | Adult Target | Child Production | Phonological process        |
|----|--------------|----------------|--------------|------------------|------------------------------|
| 1  | Indonesian   | Kuning (Yellow)| [kuniŋ]      | [nin]            | Deletion of weak syllable   |
| 2  | Indonesian   | Bonceng (Hitch)| [bonceŋ]     | [cęŋ]            | Deletion of weak syllable   |
| 3  | Indonesian   | Biru (Blue)    | [biru]       | [ju]             | Deletion of weak syllable   |
| 4  | Javanese     | Lenggah (Sit down)| [ląŋgah] | [tah]         | Deletion of weak syllable   |
| 5  | Indonesian   | Sekolah (School)| [səkolah]  | [olah]           | Deletion of weak syllable   |
| 6  | Indonesian   | Sepatu (Shoe)  | [səpatu]     | [atu]            | Deletion of weak syllable   |
| 7  | Indonesian   | Abu-abu (Grey)| [abu-abu]    | [ambu]           | Deletion of weak syllable   |
| 8  | Javanese     | Ora nana (None)| [ora nana]  | [nana]           | Deletion of weak syllable   |
| 9  | Javanese     | Kiye (Here)    | [kiye]       | [je]             | Deletion of weak syllable   |

Based on Table 5 above, the words can be classified into disyllables, trisyllables, and tetrasyllables. There are five words consisting of disyllables for example [kuniŋ] (Yellow), [bonceŋ] (Hitch), [biru] (Blue), [ląŋgah] (Sit down) and [kiye] (Here). The example of deletion of weak syllable is when Rafanda is asked about the color of his cloth; and he answers only [nin] instead of full word [kuniŋ]. As Ingram (1976) states that the syllable structure processes often occur with the other process such as substitution and assimilatory processes. The word [kuniŋ] encounters two phonological processes. The first process is deletion of the weak syllable [ku-]; and then there is substitution processes of fronting in which the alveolar nasal /n/ substitutes for the velar nasal /ŋ/. Therefore, Rafanda pronounced [nin] instead of [nįŋ]. These processes also occur when Rafanda pronounced [cęŋ] instead of [bonceŋ]. Another example is for [ląŋgah], a Javanese language of sitting down. Rafanda
pronounced only [tah]. There is a deletion of weak syllable [ləŋ-]; and it is followed by substitution of the voiceless alveolar plosive /t/ for the voiced velar plosive /g/. The four examples of disyllables also show that if the words consist of disyllables. Rafanda will tend to pronounce only monosyllable. This pattern is also found in a research conducted by Adnyani & Pastika (2016) that a 17 months toddler pronounced [τaʔ] only instead of [buka] (open).

Second is for trisyllables. There are two words consisting of trisyllables, [səkolah] (School) and [səpatu] (Shoe). Rafanda pronounced only [olah] instead of [səkolah]. There is deletion of weak syllable [sə-]; and after the word becomes disyllables [kolah]; there is initial consonant deletion of the voiceless velar plosive /k/. Therefore, it becomes [olah]. These processes also occur in word [səpatu]. There is deletion of weak syllable [sə-]; and then it becomes [patu]. The process is also followed with the initial deletion of the voiceless bilabial plosive /p/. Therefore, Rafanda pronounced only [atu] instead of [səpatu]. The two examples of trisyllables show that if the words are trisyllables, it would become disyllables.

Third is for tetrasyllables. There are also two examples of tetrasyllables, [abu-abu] (Grey) and [ora nɑnɑ] (None). Rafanda pronounced [ambu] for [abu-abu]. There is process of deletion of weak syllable [abu-]; but it is also followed with the insertion of the bilabial nasal /m/. Therefore, Rafanda pronounced [ambu]. The other word is for [ora nɑnɑ]. The process is only deletion of weak syllable [ora-]; and it becomes [nɑnɑ]. The two examples show that if the words are tetrasyllables, Rafanda tends to pronounce them disyllables.

4.4 Words without Phonological Processes

Besides the three types of phonological processes, there are also found words without phonological processes undergone by Rafanda. There are four words that Rafanda is able to pronounce it correctly, as can be seen below.

| No | Language | Glossary         | Adult Target | Child Production | Phonological process |
|----|----------|------------------|--------------|------------------|---------------------|
| 1  | Indonesian | Upi (Name of person) | [upi]       | [upi]            | -                   |
| 2  | Indonesian | Mimi (Drink)      | [mimi]       | [mimi]           | -                   |
| 3  | Indonesian | Mama (Mommy)      | [mama]       | [mama]           | -                   |
| 4  | Indonesian | Dede (Brother)    | [dɛdɛ]       | [dɛdɛ]           | -                   |

There are four words that do not undergo phonological processes by Rafanda. The first word is for [upi] (name of person). This word consists of disyllable. If we see the example of [madu] and [maəm], these two disyllables only encountered phonological processes of initial consonant deletion and become [adu] and [aəm]. These patterns are similar to [upi] that begins with vowel. It indicates that if the words begin with vowel; and consist of disyllable so Rafanda will not face difficulty to pronounce the word correctly.
The other words are for \[mimi\] (drink), \[mama\] (mommy), and \[dɛdɛ\] (bother). These words are disyllables consisting of repetition of a single syllable. According to Clark (2009) between 6 and 8 months, infants begin to babble a single syllable repeated. Therefore, Rafanda does not face any difficulty when pronouncing these words because the patterns of these words are single syllable repeated such as \([ma] + [ma]\) becoming \([mama]\), \([dɛ] + [dɛ]\) becoming \([dɛdɛ]\), and \([mi] + [mi]\) becoming \([mimi]\).

5. Conclusion

This study reveals that the phonological processes undergone by Rafanda, a 18-months Javanese-Indonesia toddler, are divided into three categories, substitution, assimilatory, and syllable structure processes. The syllable structure processes with the initial consonant deletion are the most dominant processes. Rafanda tends to omit the initial consonant in words with disyllables, trisyllables and tetrasyllables. For the words with trisyllables and tetrasyllables, there will be deletion of weak syllable to become disyllables. If the disyllables begin with consonant, so Rafanda will do deletion of initial consonant frequently.

There are also some phonemes that Rafanda tends to substitute for other phonemes such as the voiceless velar plosive /k/ and the voiced velar plosive /g/ are replaced with the voiceless alveolar plosive /t/; the velar nasal /ŋ/ with the alveolar nasal /n/; voiceless alveolar fricative /s/ and voiceless labiodental fricative /f/ with the voiced palatal plosive /c/.

However, there are also some words that can be pronounced correctly by Rafanda such as \[mimi\] (drink), \[mama\] (mommy), and \[dɛdɛ\] (bother). These words are able to pronounce correctly because at age of 6 and 8 months, an infant usually babbles a single syllable repeatedly such as \([ma] [ma] [ma]\). Therefore, Rafanda does not face any difficulty to pronounce these words.

References

Adnyani, N. L. P. S., & Pastika, I. W. (2016). Phonological Development in the Early Speech of an Indonesian-German Bilingual Child. Research in Language, 14(3), 329–350. https://doi.org/10.1515/rela-2016-0017

Alexander, M. A., Matthews, D. J., & Murphy, K. P. (2015). Pediatric Rehabilitation: Principles and Practice. Pediatric Rehabilitation (5th ed.). New York: Demos Medical.

Ashford, J. B., LeCroy, C. W., & Williams, L. R. (2018). Empowerment Series: Human Behavior in the Social Environment: A Multidimensional Perspective (6th ed.). Boston: Cengage Learning.

Baker, E., Croot, K., McLeod, S., & Paul, R. (2001). Psycholinguistic Models of Speech Development and Their Application to Clinical Practice. Journal of Speech, Language, and Hearing Research: JSLHR, 44, 685–702. https://doi.org/10.1044/1092-4388(2001/055)

Bergelson, E., & Swingley, D. (2012). At 6-9 months, human infants know the meanings of many common nouns. Proceedings of the National Academy of Sciences of the United States of America, 109(9), 3253–3258.
Phonological Processes in A 18-Months Bilingual Toddler

Bernthal, J. E., Bankson, N. W., & Flipsen, P. (2016). Articulation and phonological disorders: speech sound disorders in children (8th ed.). Boston, Mass: Pearson.

Bowen, C. (2015). Children’s Speech Sound Disorders (Vol. 3). Chichester, West Sussex: John Wiley & Sons, Ltd.

Claessen, M., Beattie, T., Roberts, R., Leitao, S., Whitworth, A., & Dodd, B. (2017). Is two too early? Assessing toddlers’ phonology. Speech, Language and Hearing, 20(2), 91–101. https://doi.org/10.1080/2050571X.2016.1222723

Clark, E. V. (2009). First Language Acquisition (2nd ed.). Cambridge: Cambridge University Press.

Cleeland, J., Scobie, J. M., Heyde, C., Roxburgh, Z., & Wrench, A. A. (2017). Covert Contrast and Covert Errors in Persistent Velar Fronting. Clinical Linguistics and Phonetics, 31(1), 35–55. https://doi.org/10.1080/02699206.2016.1209788

Fabiano-Smith, L., & Cuzner, S. L. (2018). Initial consonant deletion in bilingual Spanish–English-speaking children with speech sound disorders. Clinical Linguistics and Phonetics, 32(4), 392–410. https://doi.org/10.1080/02699206.2017.1367037

Ingram, D. (1976). Phonological disability in children. London: Edward Arnold.

Ingram, D. (1989). First language acquisition: Method, description, and explanation. Cambridge: Cambridge University Press.

James, D. G. H., Ferguson, W. A., & Butcher, A. (2016). Assessing children’s speech using picture-naming: The influence of differing phonological variables on some speech outcomes. International Journal of Speech-Language Pathology, 18(4), 364–377. https://doi.org/10.3109/17549507.2015.1101159

James, D., van Doorn, J., McLeod, S., & Esterman, A. (2008). Patterns of consonant deletion in typically developing children aged 3 to 7 years. International Journal of Speech-Language Pathology, 10(3), 179–192. https://doi.org/10.1080/17549500701849789

Jhang, Y., & Oller, D. K. (2017). Emergence of functional flexibility in infant vocalizations of the first 3 months. Frontiers in Psychology, 8(MAR). https://doi.org/10.3389/fpsyg.2017.00300

Lauwers, J., & Swisher, A. (2011). Counseling the Nursing Mother: A Lactation Consultant’s Guide (5th ed.). Sudbury: Jones & Bartlett Learning.

Levine, L. E., & Munsch, J. (2016). Child development from infancy to adolescence: An active learning approach (6th ed.). London: SAGE Publications, Inc.

Liszkowski, U. (2014). Two sources of meaning in infant communication: Preceding action contexts and act-accompanying characteristics. Philosophical Transactions of the Royal Society B: Biological Sciences, 369(1651). https://doi.org/10.1098/rstb.2013.0294

Liu, L., Li, W., Wu, X., & Zhou, B. X. (2019). Infant cry language analysis and recognition: An experimental approach. IEEE/CAA Journal of Automatica Sinica, 6(3), 778–788. https://doi.org/10.1109/JAS.2019.1911435

Stark, R. E. (1978). Features of infant sounds: The emergence of cooing. Journal of Child Language, 5(3), 379–390. https://doi.org/10.1017/S0305000900002051