

CHAPTER II

LITERATURE REVIEW

2.1. Theoretical framework

2.1.1 Autism

Autism is a neurological disorder that usually manifests itself early in the toddler years (Robledo & Ham-Kucharski, 2005). Hampering a child's ability to learn how to communicate, interact with others socially and indulge in an imaginative play classified officially as a pervasive development disorder (PDD) and autism inhibits a child's development (Robledo & Ham-Kucharski, 2005).

The first mention of autism as a disorder appeared in Baltimore doctor Leo Kanner's 1943 paper, "Autistic Disturbances of Affective Contact" which described his observations of children who exhibited symptoms that at the time were considered indicative of mental or emotional handicap (Exkorn, 2005). Then, a year later, Viennese doctor Hans Asperger wrote a comparable to those described by Kanner and which was later termed Asperger's syndrome, a type of autism (Exkorn, 2005).

Many children with autism demonstrate delayed oral motor development which impacts their speech and expressive language development (Flanagan, 2008).

Some behaviors that suggest the need for an evaluation of the child's oral motor skill by a licensed speech- language pathologist with knowledge about normal and abnormal oral-motor-development include: excessive food loss, mouthing inedible objects after the age of two, presence of oral reflexes after eight months of age and unintelligible speech production after the age of three (Flanagan, 2008).

When autistic child tries to say things which he has thought out for himself, his utterances may be very poor indeed (Wing, 1985). He has trouble with the same sounds that bother young normal children, such as "s", "th" and "sh" and autistic child often misses off the ends of words or use fragments of words like "li" for "lid" and "bicle" for "bicycle" (Robledo & Ham-Kucharski, 2005). And an autistic child usually has difficulty in controlling the volume of his voice. He finds it hard to produce a smooth flow of speech; his voice goes up and down in the wrong places and may have a mechanical quality (Wing, 1985). Autistic child also hard to utter word because the speech center is not receiving messages from other areas to initiate speech or voice (Nambudripad, 2007)

2.1.2 Phonological Alternation

Some of the focus of recent phonological thinking concerns to the characterization of predictable alternations between sounds found in natural languages (Davenport & Hannahs, 1998). The process of alternation is occurred

under a specific condition where there is an alternation in the representation of elements on the phonetic level between sounds (Davenport & Hannahs, 1998).

In autistic children, phonological alternation may occur and damage in spontaneous speech (Lord and Paul, 1997). In certain cases, speech alternations like distortion or changes can show some mistakes similar to those found in children with cognitive delay or language delay (Zhao, 2006). Language alternation in autistic children are described as specific language disorder and the phonological alternation disorder refers to a change in the expressive aspects characterized by alternation in oral production (fluency and production) which become the result of the difficulty in understanding (Zhao, 2006). According to Giegerich (1992), phonological alternations are divided into three main categories: they are insertion, deletion and metathesis.

2.1.2.1 Insertion

The process of an insertion is adding new segments inside the word. This process is the opposite of a deletion rule, so inserting some segments would be expressed by starting with zero: \emptyset , as in the example of the word /film/ which becomes [filəm].

2.1.2.2 Deletion

The process of a deletion rule is erasing an underlying segment – in phonemic theory, every underlying segment must have a corresponding surface segment. Every phoneme has a realization deletion rules which are not permitted. Deletion shows express in terms of a segment ‘becoming Ø’ (zero). In the example of the word /hand/, here the /d/ of /hænd/ and the /t/ of /list/ are deleted word-finally: /hænd/ - [hæn] and /list/ - [lis].

2.1.2.3. Metathesis

This process refers to the changing of a sequence of elements, often segments, in a word of modern English like in the word “bird”, “first” and “third” which historically, the earlier forms were “brid”, “frist” and “thridde”. In each of these cases the sequences of [r] and [i] has been reversed.

2.1.3 Phonological Processes

The characterization of alternations are caused by some phonological processes (House, 1998) and the processes can be represented and characterized the alternations that result from them by means of rules which express the relationship between units on the different levels of the phonological components (House, 1998).

Therefore, the main thrusts of much generative phonology are the identification of such alternation, the phonological processes behind them and the formalization of the most appropriate rules to capture them (Giegerich, 1992)

Comparing to the word simplification in normal children, normal children make characteristic changes in their pronunciation. Those changes tend to be systematic rather than random, because phonological processes occur on the alternation. Children use these processes as the way to simplify speech while trying to reach the adult target words (Ingram, 1979). There are three types of phonological processes according to Ingram: substitution process, assimilatory process, and syllable structure process.

2.1.3.1 Substitution Process

Substitution Process is the process in the systematic replacement of a sound with an alternative so that children who produce the word seems easier to articulate. The kinds of substitution process are:

1. *Stopping Fricatives* (sometimes happened in other sounds): are replaced by a stop consonant. Example: king - [kiŋ]; zebra-[di: brə].
2. *Fronting*: velar and palatal consonants tend to be replaced by alveolar. Example: chip - [tʃɪp]; call - [tɑ].
3. *Gliding*: a glide, [w] or [j] is substituted by a liquid sounds [l] or [r]. Example: leg - [jek]; story - [stowi].

4. *Vocalization*: a vowel replaces a syllabic consonant. Examples: apple - [apo]; button - [bʌtʌ].
5. *Vowel Neutralization*: a vowel tend to be changed into oral and sometimes centralized vowels ([ʌ], [a]). Example: fat - [fat]; back - [bat].

2.1.3.2. Assimilatory Process

Assimilatory process is the modification of one or more features of a segment which is influenced by neighboring sound. The kind of assimilation processes are:

1. *Voicing*: consonants tends to be voiced when they are preceding a vowel, and devoiced at the end of a syllable. Examples: tiny - [daini].
2. *Consonant harmony*: in CVC context, consonants seemed to assimilate each other in certain ways. There are three frequent patterns:
 - a. *Velar assimilation*: apical consonants tend to assimilate to a neighboring velar consonant. Examples: duck - [gʌk].
 - b. *Labial assimilation*: apical consonants tend to assimilate to a neighboring labial consonant. Examples: tub - [bʌb].
 - c. *Denasalization*: a nasal consonant will denasalize in the neighborhood of a non-nasal consonant. Examples: spoon - [bu:d].

3. *Progressive vowel assimilation*: it is unstressed vowels which assimilate to a preceding or following stressed vowel. Examples: flower - [fá:wa]; hammer - [ha:ma].

2.1.3.3. Syllable Structure Process

Syllable structure process is the systematic deletion of certain sounds in order to make syllable structure simple. Common syllable structures are cluster reduction, deletion of final consonant, deletion of unstressed syllables, and reduplication. In the level of segmental, the syllable structures consist of:

1. *Cluster reduction*: a consonant cluster is reduced to a single consonant. Examples: dress - [dɛs]; stop - [stʌp].
2. *Deletion of final consonant*: a CVC syllable is reduced to CV by deleting the final consonant. Examples: more - [mʌ]; out - [aʊ].

2.1.4. Indonesian Vowels and Consonants

In this study, the writer uses sound classification by Alwi et al. (2000). He classified Indonesian vowels into ten types, diphthongs into three types and consonants into 22 types which can be seen on the next page:

Table 2.1
Indonesian Vowels

No	Vowels		Positions	Examples
1	[i]	/i/	Front, high, upper	Ibu, kita, lari
2	[I]	/i/	Front, high, lower	Pinggir, kelingking
3	[e]	/e/	Front, middle, upper	Ekor, enak
4	[ε]	/ε/	Front, middle, lower	Nenek, dendeng, leher
5	[a]	/a/	Front, low	Ada, apa, pada
6	[ə]	/ə/	Central, middle	Emas, iseng, elang
7	[ɔ]	/o/	Back, middle, lower	Otot, roti, tokoh
8	[o]	/o/	Back, middle, upper	Toko, gado-gado
9	[u]	/u/	Back, high, lower	Ukur, urus, turun
10	[u]	/u/	Back, high, upper	Udara, utara, bukan

Table 2.2
Indonesian Diphthongs

1	[ai]	Up, closed, forward	Pakai, nilai, sampai
2	[oi]	Back, closed, forward	Amboi, sepoi-sepoi
3	[au]	Up, closed, backward	Saudara, lampau

Table 2.3
Indonesian Consonants

Place of Articulation		Manner of Articulation					
		Bilabial	Labiodental	Dental/ Alveolar	Palatal	Velar	Glottal
Stop	Voiceless	p		t		k	ʔ
	Voiced	b		d		g	
Nasal	Voiced	m		n	ɲ	ŋ	
Fricative	Voiceless		f	s	ʃ	x	h
	Voiced			z			
Affricate	Voiceless				c		
	Voiced				j		
Retroflex	Voiced			r			
Lateral	Voiced			l			
Semi-Vowel	Voiced		w		y		

2.1.5 The order of Phonological Acquisition

Children acquire sound through stages as stated by Fromkin et.al (2003:351-352) children do not wake up in one fine morning with fully formed grammar in their heads. Relative to the complexity of the adult grammar that they eventually attain, the process of language acquisition is fast, but it is not instantaneous (Fromkin et.al, 2003:351-352). From first words to virtual adult competence takes three to four years, during which time children pass through linguistic stages (Fromkin et.al, 2003:351-352).

By the time children get to the age of one year, they begin to utter understandable words. In order to be meaningful, they have to acquire the sounds of its language. The order of acquisition between consonant and vowel is up side down. According to Steinberg (2001:5), consonants are acquired in a front-to-back order. On the contrary, vowel is in back-to-front order, where 'front' and 'back' refer to the origin of the articulation of the sound. Therefore, sounds /p/, /b/, /m/, /t/, and /d/ are acquired before /k/, /g/, and /x/; also sounds /a/ and /o/ precede /i/ and /Λ/.

Lewis (1996:195) stated that the first consonant sounds to be consistently articulated correctly are nasals (/m/, /n/, /ŋ/), stops (/p/, /b/, /t/, /d/, /k/, /g/), and glides (/h/, /w/, /j/). Subsequently, most fricatives (/s/, /ʃ/, /z/, /v/, /f/) are articulated correctly. Liquids (/l/, /r/), affricates (/dʒ/, /tʃ/), some fricatives (/θ/, /ð/), and consonant clusters (*bl, st, tr, str*) are among the last types of sounds to be consistently

articulated correctly. It is not surprising since those sounds are acquired from mouth and lips movement, which are visible articulators. Whereas other sounds, like fricatives /s/ and /z/ and stops /k/ and /g/, which is acquired from non-visible articulators tend to be acquired later. The same goes for vowel. Those, which are closest to the resting position of articulators, e.g. back vowel such as /a/ (*watch*), are easier to create and are learned earlier. While those which require more motor control to create, e.g. a tensed front vowel such as /i/ (*feet*) are learned later (Steinberg et.al, 2001:6). This stage is the transition period, from babbling to speech. The sounds that emerge in this stage are those usually uttered in babbling, especially made in the front of mouth such [b], [p], [m], [d], and [a], [u] for vowels.

Entering the third year, the amount of vocabularies increase into a number of words. Along with the increasing vocabulary, the kinds of sounds also increase in number. Children spontaneously begin to join vocabulary items into two word phrases. Paul and Jennings (1989) reported that by 24 months, normal children produce many syllables that contain two different consonant as well as some multi-syllabic words, including a few words with consonant clusters, like the *pl* in *play* (qtd. in Lewis, 1996:195). In normal development, two year old children have acquired a number of consonant and vowels. Sounds like [p], [b], [m], [n], [h], and [w] are already being 50% produced correctly before the age of two, while the velar; [k], [g], and [ŋ], and alveolar stops; [t] and [d], are pronounced 50% correctly at the

age of two. At nearly the end of two years of age, therefore, children have pronounced almost all of those sounds, except the sound [b], [ŋ], and [w].

2.2. Review of related studies

There have been some studies concerned with the same subject used in this study; one study in particular discusses similar issue about phonological alternation produced by children in speaking our mother language, Bahasa Indonesia. The study entitles “phonological alterations of Indonesian speaking children with mental retardation (a case study of psycholinguistics)” written by Moelissiana (2000), a former student of Faculty of Humanities, Airlangga University.

The analysis found that the participants who are mental retarded children altered some consonants and vowel that they produced. In the study several experimental have found that mentally retarded children are slower perceptual information processors than non-mentally retarded children. However, this difference in speed is not found when mentally retarded children are compared with non-mentally retarded children of the same mental age. The finding of Moelissiana’s study (2000) is an important reminder that normal children of the same chronological age as mentally retarded children have a much higher “mental-age” (qtd. Schwartz & Johnson, 1985).

In the study of phonological alternation of Indonesian speaking children with mental retardation, there was international review of research which stated that no

reliable differences between the cognitive structures used by mentally retarded subjects and those used by normal subjects to complete cognitive tasks. In terms of information-processing theory, the structure of memory appears to be the same in the mentally retarded and in normal (Schwartz & Johnson, 1985).

In addition, language ability influences memory and thinking in several ways. One of the most important is its role in organizing information. In a series of free recall experiments in which children had to remember word lists, mentally retarded children tend to make minimal use of semantic cues to organize their remembrance. That is, they are unlikely to group items from a single semantic category together in remembrance (Schwartz & Johnson, 1985).

According to Schwartz and Johnson (1985) language ability influences memory and thinking in several ways in mental retarded children but it could be different from autistic children as autism is not an intellectual disorder. While autism influences the ability of children with autism in sharing information (qtd. Sundberg & Partington, 1998) and some parts of their phonological development, such as the suprasegmental features of rate, prosody, rhythm, and quality represent as the delayed aspect of autistic children's speech (Bartolucci, et al., 1976).

Furthermore, study about Language and Autism done by Gomes and Salvador (2007) from Methodist University Center-IPA explained that language alternations appear in the literature as the first concern parents of autistic children and even health

professional. This focus appears in most different situation, from a child 2 years age who has not begun to talk to the presence of a peculiar speech, difficulty to understand the meaning of language, atypical pronunciation intonation and pronominal inversion. The language deficit in autistic children has been described into two ways, one is more severe and involves a receptive and expressive disorder in which understanding is very impaired at all levels, another in which the disorder is softer, hampering semantics and pragmatics with phonology and syntax are being preserved (Minshew, Meyer, and Dunn, 2003). While for Chiang and Peter (2007), individuals with autism have been widely reported as demonstrating problems associated with spontaneity of communication. Central to clarify of the way that spontaneity offers the potential for understanding the circumstances under which communication occurred. In short, a clearer understanding of the nature of mechanism affecting problems in communicative spontaneity has the potential to inform intervention, resulting in better functional communication outcomes for individual with autism (Chiang and Carter, 2007).

Another study about phonological processes also has been done by Prasetiowati (2006). Her study was given a title called "A Study of Phonological Processes in Indonesian Word Simplification Made by Two-year Old Children". The purpose of this study is to find out the types of phonological processes that occurred in Indonesian word simplification. In this study, the writer uses Ingram's phonological processes theory. Based on the data analysis, the writer found that not

all types of phonological processes occur in two-year-old children as the participants. There are only eight from 13 types of process occurred. In addition, the writer also found eight other processes that are not included in Ingram's. The sound alternations in word simplifications are influenced by the factor of visibility of articulators, which concerns with place of articulation of the sound, and the factor of ease of articulation, which concerns with manner of articulation of the sound.

Some studies that focused on phonological development showed that the processes of phonology in children's word simplifications did occur in English. Moreover, Ingram (1979) reviewed that those processes are found not only in English, but also in other languages (French, Hungarian, Polish, Estonian, and Romanian).

In Indonesia, study of phonological development is still rare. The studies done, mostly, concentrated on syntax and grammar. Study of phonological processes done by Belda (1995) showed that Indonesian children also simplify their words while acquiring Indonesian. She found that phonological processes occurred while children simplifying their words. Those processes are stopping, denasalization, substitution of alveolar, substitution of retroflex, substitution of stops, fronting, velar assimilation, reduplication, deletion of unstressed syllable, and cluster reduction. Belda agreed that a child uses phonological processes as strategies to simplify the utterances while talking. In addition, Belda's study in 1;8 year old child showed other processes. These are gliding, voicing, labial assimilation, and vowel neutralization.

Diary studies done by Velten (1943, in Ingram 1989) and Leopold (1947, in Ingram 1989) on their own daughter showed that children simplify their words while acquiring English. Both Velten and Leopold found that their daughter made some common patterns that can be found in other children. Those patterns are prevocalic voicing, final devoicing, stopping, fronting, gliding, vocalization, final consonant deletion, cluster reduction, and unstressed syllable deletion. The difference is that Velten's daughter showed some less common patterns than other children in acquiring English. Deletion of liquids (intervocalic consonant deletion), the change or frication of /dʒ-/ , /l-/ , /-l-/ , /-r-/ , and /-t-/ into [z], and denasalization. Meanwhile Leopold's daughter did preferences in producing sounds, which is substituting the final position of /f/ , /s/ , /z/ , /ʃ/ , /ʒ/ with [j]. Besides, Leopold also found the substitution of /f-/ with [w], which suggested some influence from his daughter's simultaneous acquisition of German.