CHAPTER II
REVIEW OF LITERATURE

2.1 Psycholinguistics

Psycholinguistics basically deals with how language is learned. It is a subdivision of the fields, psychology and linguistics. Just as psychology is the study of human behavior, so psycholinguistics is the study of language behavior (Farhady, 1995). It is an interdisciplinary field of study working with cognitive science, and speech science by aiming to perceive how language is acquired, how it is produced and how it functions in the brain. (Fernandez and Cairns, 2011).

Psycholinguistic viewpoint in teaching reading puts emphasis on phonological components of language, which opposes the perception of “whole language” embraced in 1970s or general meaning of text regardless of specific understanding of phonemes or morphemes (Smith, 2004: 234). It is suggested there are two different techniques of reading, named top-down and bottom-up reading in cognitive science. The theory says that top-down readers do not focus on reading the words individually, but guess the meaning of the next word while their eyes pass over the text. On the flip side, bottom up readers start reading from letters to words, then sentence and the meaning. However, it is argued that contrary to what is believed, a competent reader does not always pass over the word by guessing the meaning but reads the word with a single phoneme; like reading “midnight” but only recognizing the “d.” In addition to this “the reader may be able to see enough to identify the next word as ‘please’, but will most likely not be able to identify the next word as ‘remember’. ” Therefore, it is asserted that in any cases readers need to use bottom-up method. (Brown n.d: 6).

First language (L1) learners try to read every word, figure out sentences and comprehend the meaning, that is, they tend to use bottom-up reading. On the other hand, second language (L2) learners prefer the top-down reading since they do not have a good command of rules of usage or grammar; they try to guess the meaning of the text. Yet, when the reader is aware of the cultural background of the text she/he can perceive the meaning by guessing words or sentences further along in the text, which refers to top-down reading. Still, if there is no such awareness or previous
knowledge of the text, the reader will try to decode the text. So the bottom-up reading process is used both in L1 and L2 acquisition (Brown n.d). This indicates the need of recognizing the every component of language that is phoneme, morpheme, syntax and semantics for all readers, which is the primary concern for dyslexic children as well.

2.2 Learning Disorder

Learning disorder or learning disability is a classification that includes several areas of functioning in which a person has difficulty learning in a typical manner, usually caused by an unknown factor or factors. Given the "difficulty learning in a typical manner", this does not exclude the ability to learn in a different manner. Therefore, some people can be more accurately described as having a "Learning Difference", thus avoiding any misconception of being disabled with a lack of ability to learn and possible negative stereotyping. (wikipedia.org)

Learning disorders are diagnosed when the individual’s achievement on individuality administered, standarized test in reading, mathematics, or written expression is substantially below that expected for age, schooling, and level of intelegence. The learning problems significantly interfere with academic achievement or activities of daily living that require reading, mathematical, or writing skills. (American Psychiatric Association, 2000: 49)

Lying upon both definitions above, learning disorder can affect a person's ability to speak in language. Inability of a person in understanding the language of the learning process can be called language disorder.

In the other hand, there are some comprehension of learning disorder. Learning disorder is a disability that can not be seen physically. An inability to learn can not be recognized in a physical form that is different from any other normal person. (Wood, 2005: 20)

Learning disabilities, or learning disorders, are an umbrella term for a wide variety of learning problems. A learning disability is not a problem with intelligence or motivation. Kids with learning disabilities aren’t lazy or dumb. In fact, most are just as smart as everyone else. Their brains are simply wired differently. This difference affects how they receive and process information. Simply put, children and
adults with learning disabilities see, hear, and understand things differently. This can lead to trouble with learning new information and skills, and putting them to use. The most common types of learning disabilities involve problems with reading, writing, math, reasoning, listening, and speaking. (as cited in helpguide.org)

Kids Health (2013) states that for someone diagnosed with a learning disability, it can seem scary at first. But a learning disability doesn't have anything to do with a person's intelligence — after all, successful people such as Walt Disney, Alexander Graham Bell, and Winston Churchill all had learning disabilities. Learning disabilities are problems that affect the brain's ability to receive, process, analyze, or store information. These problems can make it difficult for a student to learn as quickly as someone who isn't affected by learning disabilities. There are many kinds of learning disabilities. Most students affected by them have more than one kind. Certain kinds of learning disabilities can interfere with a person's ability to concentrate or focus and can cause someone's mind to wander too much. Other learning disabilities can make it difficult for a student to read, write, spell, or solve math problems. The way our brains process information is extremely complex — it's no wonder things can get messed up sometimes. Take the simple act of looking at a picture, for example: Our brains not only have to form the lines into an image, they also have to recognize what the image stands for, relate that image to other facts stored in our memories, and then store this new information. It's the same thing with speech — we have to recognize the words, interpret their meaning, and figure out the significance of the statement to us. Many of these activities take place in separate parts of the brain, and it's up to our minds to link them all together.

According to Lyness (2013) Just because you have trouble studying for a test doesn't mean you have a learning disability. There are as many learning styles as there are individuals. For example, some people learn by doing and practicing, while others learn by listening (such as in class) or prefer to read material. Some people are just naturally slower readers or learners than others, but they still perform well for their age and abilities. Sometimes, what seems to be a learning disability is simply a delay in development; the person will eventually catch up with — and perhaps even surpass — his or her peers.

But many people with learning disabilities struggle for a long time before someone realizes that there's a reason they're having so much trouble learning. For
most people in their teen years, the first telltale sign of most learning disabilities occurs when they notice that there's a disconnect between how much they studied for a test and how well they performed. Or it may just be the feeling a person has that something isn't right. (as cited in kidshealth.org)

2.3 Language Disorder

There is a case in which a child experiences difficulty in communication with his fellow or his teacher for instance poor vocabulary or incorrect grammatical. It is known as language disorder. Better Health Cannel (2009) states that language disorder may include difficulty in speaking, listening, and learning whether reading or writing; or a combination of all these areas. It shows that language disorder does not only affect speaking and listening but also learning. In addition, based on Haring (1974) “learning disability is a behavioral deficit almost always associated with academic performance and that can be remediated” (ascited in Somantri, 2007: 195).

According to Indah & Abdurrahman (2008: 129) linguistically language disorder is “inability of acquiring and processing linguistic information”. They point to two failures both acquiring and processing the information which can affect his basic language skills while communicating with others. In addition, based on Allen (2010) language disorders involve the area of the brain that controls the processing of language and communication. It means that language disorder is not affected by physical handicapped. Language disorder affects learning disability. Because of that language disorder is divided into two based on learning disability such as expressive language disorder and receptive language disorder.

2.3.1 Receptive Language Disorder

According to Better Health Channel (2010) “receptive language disorder affects someone in understanding his interlocutor utterance. Other names of receptive language disorder are central auditory processing disorder and comprehension deficit.” Based on Logsdon (2010), receptive language disorder is a type of learning disability which affects understanding in speaking and sometimes in writing. In short receptive language disorder affects understanding in verbal communication and learning because of auditory processing disorder.
2.3.2 Expressive Language Disorder

According to Allen (2010), “expressive language is the ability to express your ideas and thoughts to others. Meanwhile, expressive language disorder is a condition in which a person has difficulty expressing themselves with language, both in speech and writing.” Based on Logsdon (2010), children with expressive language disorder have difficulty with language processing and the connection between words and ideas they represent. Some people may also have problems with pronunciation of words. Thus, expressive language disorder is an inability to express ideas and thoughts through language whether oral and written.

Children who suffer language disorder have difficulties in understanding language, knowing what certain language concept means, following direction and remembering information presented orally. They need a little help from others to make everything clearer. Actually, they are bright and smart but they are different. The difference makes them extraordinary than others, have special skills, for instance drawing.

2.4 Dyslexia

Dyslexia is originally from Greek; “dys” means lack of or difficult and “lexia or lexicon” means pertaining the words (Mississippi Department of Education, 2002:1). According to Mississippi Law (in Mississippi Department of Education, 2002: 2) “dyslexia means a language processing disorder that may be manifested by difficulty in processing expressive or receptive, oral or written language despite adequate intelligence, educational exposure, and cultural opportunity”. Thus, it argues that dyslexia is not only about language disorder but also learning disability.

Hudson, High, and Al Otaiba (2007) argue that, dyslexia is a specific learning disability in reading that often affects spelling as well. Specifically, learning disability (LD) is specific learning disability (SLD) (Wilmshurst, 2005: 209). According to IDEA (Individual with Disability Education Act) (1999) specific learning disability (SLD) means “a disorder in one or more of the basic psychological process involved in understanding or using language, spoken or written, in which the disorder may manifest itself in an imperfect ability to listen,
think, speak, read, write, spell, or to do mathematic calculations” (as cited in Wilmshurst, 2005: 211).

On the other hand, Neurologist and medical experts (Mississippi Department of Education, 2002: 3) often define dyslexia as a disability resulting from brain dysfunction which can be affecting learning academic skills such as reading, writing, spelling and math calculations. Children with dyslexia use their right brain more than left brain to process language information because of weakening function of corpus callosum (Letchumy, 2008: 117 and Ward, 2005: 4). In addition, many researchers have proved that dyslexia is suffered by more boys than girls. Stein (2009) reveals in his presentation that one in three of US and UK eleven year olds leave primary school unable to read.

In short, dyslexia is a kind of learning disability or specific learning disability. It is caused by the corpus callosum which does not work well and then the brain forces right brain to be used more than left brain to recognize and process letters, images, symbols, and concepts. In addition, dyslexia is not only about reading disorder but also writing disorder and arithmetic disability.

2.4.1 Dyslexia Based on Function Impairment

Based on function impairment, dyslexia is divided into three types such as visual dyslexia, auditory dyslexia and visual-auditory dyslexia (Letchumy, 2008).

Visual Dyslexia

According to Letchumy (2008: 119) “visual dyslexia is a disorder that can see a word which consists of some letters as well but cannot differentiate and make interpretation what he has seen”. Then Stein (2009) argues that it is caused by visual magnocellular weakness. In short, visual dyslexia is a visual disorder which affects learning process of a dyslexic in grasping the meanings of printed materials that have to be seen.

Based on extensive research on the identification of children with visual problems through observation, with subsequent validation by an eye specialist, Knox (1953) believes that the following behavioral symtomps are most usefull. Those are, facial contortions, book held close to face, tenseness during visual work, head tilting, head thrust forward, body tenseness while looking at distant objects, poor sitting
position, head moving excessively while reading, eyes rubbed frequently, tendency to avoid close visual work and tendency to lose place in reading. (as cited in Bond, 1984: 54)

**Auditory Dyslexia**

According to Letchumy (2008: 119) “auditory dyslexia is a disorder that cannot differentiate the similarity and difference between sounds they heard, be familiar with sounds of every word, and combine words in a sentence. Dyslexics cannot hear similar sounds in the beginning and ending such as boy and big, cat and math, and differentiate some words with the same vocal such as pin, pan, and pen”. Then Stein (2009) argues it is caused by auditory magnocellular weakness.

Weintraub (1972) identifies three major areas of concern. Those are, auditory acuity (hearing), audition (listening) and auditory processing (working with sounds). Often a student may have difficulty with all three aspects of hearing, but sometimes the difficulty may be specific. For example, some children with no measurable hearing loss have difficulty hearing sounds in words but no difficulty understanding the meaning of spoken sentences. Other children with hearing loss have difficulty with all the auditory aspects of language, speech and reading. Still other children have specific difficulty blending sounds into whole words and recognizing the meaning of the words. (as cited in Bond, 1984: 56)

In short, auditory dyslexia is an auditory disorder which affects learning process of dyslexic in understanding instructions or explanations that are delivered by interlocutor for instance his/her teacher.

**Visual-Auditory Dyslexia**

According to Letchumy (2008: 120) “visual-auditory dyslexia is combined between visual and auditory dyslexia also refers to as "Deep Dyslexia". A dyslexic or a person on this type has a problem in writing letters and words, grasping word-meanings, integrating the sounds of letters, and in pronouncing unfamiliar, and sometimes, even familiar words”. In short, visual-auditory dyslexia is a disorder of visual and auditory which affects learning process in understanding of materials that have to be seen or heard.
2.4.2 Dyslexia Syndrome Theory

From definition and explanation about dyslexia division based on the problem above, there is another theory that is appropriate for this study. It is Dyslexia Syndrome Theory by Levinson (1994). According to Levinson, dyslexia is divided into three types based on the difficulties; reading dyslexia, writing dyslexia (dysgraphia) and arithmetic dyslexia (dyscalculia) (as cited in Letchumy, 2008).

Reading Dyslexia /Reading Disability

In reading, children should have increased their both auditory and visual abilities to discriminate, remember and concentrate because those are very important to recognize the concept of symbols, alphabets and numbers, and meaning as well (Abdurrahman, 2003:12). If they increase neither auditory nor visual abilities, they will face any mistake in reading, for example children cannot discriminate word snack and snake even grasping meaning of the words. This disability/difficulty is called reading disorder or reading dyslexia.

Normal/typical readers and dyslexic readers use different part of brain. Usually, normal readers use their part of brain appropriately. According to BRSS (2004) “brain imaging studies have revealed that when they are reading, typical readers activate areas of the brain that are mostly in the back of the left side of the brain. Dyslexic readers, on the other hand, under activate these reading pathways”.

Based on Lyon (1999) “reading problem should be identified early, ideally between the ages of 5 and 7, when brain circuit and reading skills are being developed and can be most easily influenced” (as cited in Plotnik, 2005:320). When children with reading disorder read a text, they will see that the letters are dancing or spread out. Then Child Development Institute (2010) argues that reading disorder is caused by ineffective reading instruction, auditory perception difficulties, visual perception difficulties, and language processing difficulties. Because of that, they always delete, insert, substitute, invert, and do mirror imaging (Abdurrahman, 2003:205). Moreover, they do mirror imaging because they are confused with the letters” position either right-left or up-down. They do mirror imaging if they see similar form of letters such as b - d, m – w, p – q, and n – u. Those cause dyslexics mention wrong word and meaning, different word but similar meaning, or wrong word and no meaning (Abdurrahman, 2003:207).
In short, reading disorder or dyslexia is an inability to understand the meaning of passage from what they read using their eyes. This inability is caused by unfamiliar with words even letters and lack for visual memory. Because of that, children who suffer reading disorder do deletion, insertion, substitution, inversion, and mirror imaging.

**Writing Dyslexia/Writing Disability**

Since children are in school age, at least they should have reading skill and writing skill. Academically, writing skill is important because academicians must be able to put down their ideas in papers to explain the world whether change or judge the previous theory with the new one. In writing, someone needs to have visual, kinesthetic, and motor sensitivities, but dyslexics have them in low quality. In consequent, it affects their writing skill, called writing disorder.

Writing disorder is considered as dysgraphia. Dysgraphia is an inability to compose complete grammatical sentences. Yet, National Institute of Neurological Disorder and Stroke (2009) concludes that, “dysgraphia is characterized by wrong or odd spelling, and production of words that are not correct (i.e., using "boy" for "child"). They make inappropriately sized and spaced letters, or write wrong or misspelled words, despite thorough instruction”.

In his conclusion, Hornsby (as cited in Abdurrahman, 2003:204) points to the connection between reading and writing because when children study how to read they also study how to write what they read. That is why, what is happened to children with reading disorder/dysgraphia is happened to children with writing disorder as well. Children with writing disorder produce writing with misspelled words, inappropriately sized, delete or omit, substitute, invert, insert and do mirror imaging. One example of this difficulty is if children who do not experience this disorder/difficulty write “was” they will write “was” but children with this difficulty will write “saw”.

Abdurrahman (2003: 227) has two conclusions; first writing disorder is caused by visual and auditory perception impairment, second children with visual perception impairment will be difficult to discriminate the same letters forms, such as b and d. In addition, dyslexics will be difficult in reminding what they just heard because of auditory impairment.
In short, writing disorder or dysgraphia is a disability to recognize letters with appropriate size, understand what he writes. This disorder happened because of visual and auditory impairment.

**Arithmetic Dyslexia / Arithmetic Difficulty**

Arithmetic is mathematics. Arithmetic is about using numbers, letters and symbols. Many students are not interested in learning mathematics because arithmetic or mathematic is difficult. In fact, arithmetic is important to practice our thought logically.

According to *DSM-IV-TR* (2000) mathematic disorder may be evident in problems understanding or naming mathematical concept, operation, and functions (as cited in Wilmshurst, 2005: 210). Thus, *DSM-IV-TR* argues that children with arithmetic difficulty/disability are difficult in memorizing of addition and subtraction, multiplication table, remembering the sequence of steps in division. They do not show their mathematical work but they keep it in their mind.

There are some characteristics of children with arithmetic disability; spatial relation impairment, visual discrimination impairment, visual-motor association impairment, perseveration, object recognition impairment, and language and reading difficulties (Abdurrahman, 2003: 261). In spatial relation impairment, children are difficult in understanding whole numbers system. Then, visual discrimination impairment makes children are unable to discriminate geometry and other symbols. Besides, visual-motor association impairment makes children cannot count things orally in order. Furthermore, perseveration makes children deceived then they just give attention to one object for long time. Also, object recognition impairment makes children cannot remember what they have seen. In addition, language and reading difficulties make children in a big problem to understand the numbers system, symbols concepts, and so on.

In short, arithmetic disability or dyscalculia is a disability of understanding of symbols, concept of number, mathematical operation, and shape. In addition, children with arithmetic disability do not use essential element of visual perception, spatial relation, to learn arithmetic.
2.5 Perception

For those with dyslexia, reading is difficult because it requires rapid visual to identify letters and rapid auditory to translate sounds into words (Stein, 2009). Research studies have identified differences in the processing of visual and auditory information in dyslexic children. That is why dyslexics need to remedy their visual and auditory perceptions to recognize what they have seen and heard. Lerner argues that, perception is an ability to attach appropriate meaning to what children see, hear, and touch (as cited in Abdurrahman, 2003: 151). This ability is to interpret what children experiences. In the following, there are some perceptions which are needed to diagnose dyslexia.

2.5.1 Visual Perception

According to Mississippi Department of Education (2002: 4) visual perception includes “the distinction of likenesses and differences in size, shape, direction, color, and other qualities of the visual symbol seen”. According to National Center of Learning Disability (1999: para.3) “a visual processing, or perceptual, disorder refers to a hindered ability to make sense of information taken in through the eyes. This is different from problems involving sight or sharpness of vision. Difficulties with visual processing affect how visual information is interpreted or processed by the brain”. In short, visual perception does not involve eyes only but also brain. Brain and eyes work together to interpret information which got from eyes.

There are 5 types of Visual Perception, they are: Spatial Relation, Visual Discrimination, Figure-Ground Discrimination, Visual Closure, and Object Recognition (as cited in Abdurrahman, 2003: 154).

Spatial Relation

According to Lerner (as cited in Abdurrahman, 2003: 154), spatial relation is a perception understanding of figure or symbol’s place and relating to space as a physical dimension. This refers to the position of objects in space. It also refers to the ability to accurately perceive objects in space with reference to other objects. Based on National Center of Learning Disability (1999: para.5) reading and math are “two
subjects where accurate perception and understanding of spatial relationships are very important. Both of these subjects rely heavily on the use of symbols (letters, numbers, punctuation, math signs)”.

**Visual Discrimination**

According to Lerner (as cited in Abdurrahman, 2003: 154), visual discrimination is an ability to differentiate one object from another in its surrounding environment. In addition, National Center of Learning Disability (1999: para.7) defines visual discrimination as “the ability to recognize an object as distinct from its surrounding environment”. One example of visual discrimination activity is differentiating between /b/ and /d/ in the word bird.

**Figure-Ground Discrimination**

According to Lerner (as cited in Abdurrahman, 2003:154), figure-ground discrimination is an ability to differentiate from its surrounding background. In addition, Plotnik (2005: 127) says that in organizing stimuli we tend to automatically distinguish between a figure and a ground: the figure, with more detail, stands out against the background, which has less detail.

**Visual Closure**

According to Lerner (as cited in Abdurrahman, 2003: 154), visual closure is an ability to remember, identify or recognize a symbol or object when the entire object is not visible. In addition, Plotnik (2005: 127) says that in organizing stimuli we tend to fill in any missing parts of a figure and see the figure as complete.

**Object Recognition**

According to Lerner (as cited in Abdurrahman, 2003: 154), object recognition is an ability to recognize the characteristics of objects while looking at the object. They use this ability to recognize its characteristic. In addition, attributes which children use to identify the character of objects include: letters, numbers, symbols, words, or pictures.
2.5.2 Auditory Perception

According to Lerner (as cited in Abdurrahman 2003: 153), auditory perception is the ability to distinguish similarities and differences between sounds. In addition, National Center of Learning Disability (1999: para.17) defines auditory processing disorder interferes with an individual’s ability to analyze or make sense of information taken in through the ears. In short, auditory perception is an ability to use sense of hearing and brain to understand what they hear. According to Lerner (1988: 285) Auditory perception can be divided into five sub-fields: Phonological Awareness, Auditory Discrimination, Auditory Memory, Auditory Sequencing, and Auditory Blanding (as cited in Abdurrahman, 2003: 153)

Phonological Awareness

According to Lerner (as cited in Abdurrahman, 2003: 153), phonological awareness is a skill that is needed to associate spoken word with written language. It is an understanding of the sound structure of language that is made up of words, syllables, rhymes, and sounds (phones). In addition, based on National Center of Learning Disability (1999: para.19) states that “children who have difficulty with phonological awareness will often be unable to recognize or isolate the individual sounds in a word, recognize similarities between words (as in rhyming words), or be able to identify the number of sounds in a word. These deficits can affect all areas of language including reading, writing, and understanding of spoken language”.

Auditory Discrimination

According to Lerner (as cited in Abdurrahman, 2003: 153), auditory discrimination is an ability to remember difference between phonemes (sounds). This includes the ability to identify words and sounds that are similar and those which are different.

Auditory Memory

According to Lerner (as cited in Abdurrahman, 2003: 153), auditory memory is an ability to remember something that has heard. In addition, National Center of Learning Disability (1999: para.22) defines auditory memory as the ability to store and recall information which was given verbally. An individual with difficulties in this area may not be able to follow instructions which is given verbally or may have trouble recalling information.
Auditory Sequencing

According to Lerner (as cited in Abdurrahman, 2003: 153), auditory sequencing is an ability to remember the instruction in sequence orally. In addition, National Center of Learning Disability (1999: para.23) defines auditory sequencing as “the ability to remember or reconstruct the order of items in a list or the order of sounds in a word or syllable”.

Auditory Blending

According to Lerner (as cited in Abdurrahman, 2003: 153), auditory blending is an ability to blend elements of one phonic becoming one complete word. In addition, National Center of Learning Disability (1999: para.24) defines auditory blending as the process of putting together phonemes to form words. For example, the individual phonemes „b“, „i“, „r“ and „d“ are blended to form the word, „bird“.

2.5.3 Tactile and Kinesthetic Perception

According to Lerner (as cited in Abdurrahman, 2003: 155), tactile and kinesthetic perception is an ability to recognize objects through tactile (touched sense) and kinesthetic (body movement) modality. In addition, Mississippi Department of Education (2002: 5) defines tactile perception as the ability to recognize the differences and similarities in shapes and patterns by touch. In short, tactile and kinesthetic perception is an ability to recognize object characteristic by touched sense and body movement. Moreover, in this research tactile and kinesthetic perception is used when children pick acquaintance with alphabets and words and practices writing.

Those kinds of perceptions are crucial needs in learning process to manage any info which is received especially words and numbers. Unfortunately, dyslexics still have to train their perceptions to recognize everything around them. In the other hand, there are some concepts and teaching techniques special for dyslexics to overcome them from their difficulties.
2.6 Behaviorism Theory of Learning

Behaviorism assumes that a learner is essentially passive in responding to environmental stimuli. This theory believes that a learner starts out with a clean slate, and behavior is shaped by positive and negative reinforcement. In reinforcement, positive or negative, it increases the possibility of an event happening again. Besides, both positive and negative in punishment, decreases the possibility of an event happening again (as cited on Brittaney, 2010).

Positive reinforcement is the application of a stimulus and negative reinforcement is the withdrawal of a stimulus. Behaviorism is a precursor to cognitive learning. Important people in behaviorism, Pavlov (1897), did the experiment with the dogs; he came up with the theory of classical conditioning. In order that, Skinner (1905) developed the theory of operant conditioning which is the use of consequences to modify the occurrence and form of behavior. Watson (1920) did the “Little Albert” experiment and he gets credit for establishing the psychological school of behaviorism.

Pavlov (1897) did a famous experiment that demonstrates the theory of classical conditioning or respondent conditioning. Every time Pavlov would bring put out the dogs’ food he would ring a bell. After doing this for a certain period of time, Pavlov would ring the bell without presenting food. The dogs would salivate just from the sound of the bell. The connection the dogs made between the bell ringing and the food caused the dogs to associate the two, so they responded to the bell even without the presence of the food.

Skinner (1905) theories are schedules of reinforcement. His theories are continuous, interval, and ration. These theories are used often in daily life with everything from parenting to schooling to work life. The use of consequences to modify the occurrence or form of behavior differs from classical conditioning in that it deals with voluntary behavior. What teachers do under this theory give the learner immediate feedback, break down the task into small steps, repeat the directions as many times as possible, and work from the most simple to the most complex tasks positive reinforcement. Skinner believed that positive reinforcement is more effective in changing behavior then punishment. All of these are to be adjusted to be age appropriate. What students do under this theory is respond to reinforcement, pace
themselves in an assignment to work from the most basic to the more complicated concepts, and asking questions for more clarity in directions then ask for feedback.

This study uses behaviorism theory by skinner because this theory method is also used by the teachers in Medan Teraphy Kids Center. Based on the quitioner, there are found 5 teachers said that they do daily repetition to help the child in learning.

2.7 Teaching Method for Dyslexic Children

Reading and spelling failure, writing difficulty and arithmetic disability are common problems for dyslexics. Those cause childhood misery, depression, even frustration. Because of that, some experts have made methods to overcome their learning disability. There are three methods for teaching children with learning disability, they are Fernald Methods, Gillingham Analysis Method, and Glass Analysis Method (as cited in Abdurrahman 2003: 217-219).

Fernald has developed a multisensory reading method as known as VAKT method (visual, auditory, kinesthetic, and tactile). This method used selected reading material from the words spoken by the child, and each word is taught as a whole. This method has four stages. The first stage, teachers who want to learn to write words on paper with crayons. Furthermore, the children explore writing with their finger. At the time of writing trace, the child saw the writing, and speak it loudly. This process is repeated so the child able to write the word correctly without seeing an example. On the second stage, the child explore the writing with their finger but not too long, they study the teacher's writing by see the teacher write, as the teacher speak it. Children learn new words at the third stage, by see the writing on board or printed writing, and pronounce the word before writing. At this stage the child begins reading from a book. In the fourth stage, the child is able to remember the printed words or parts of words that have been learned (as cited in Abdurrahman 2003: 217).

In Glass Analysis Method (as cited in Abdurrahman 2003: 218) there are two sections; first is decoding and the second is reading. In first step, children are expected to recognize the phoneme (sounds) of copied words. In the second step, children are expected to attach a meaning of a printed word that they read. Glass
though that by using this method is expected children to apply their visual and auditory perception.

In Glass Analysis Method, it has four steps in teaching words to children with dyslexia. First, a teacher asks the children to identify letters, words, and syllable completely. Second, the teacher asks the children to mention letters then syllable. Third, the teacher presents children letters and syllable. The last, the teacher presents an incomplete word then asks children to mention the rest of letters.

On the other hand, Gillingham and Stillman (as cited in Letchumy, 2008) has improved a learning concept for children with dyslexia. There are three main learning concepts for learning disability; first, teaching phonics directly through introducing the alphabets and it sounds, followed by ability to produce sound by combining words; second, use of variety of sense of body in teaching through visual, auditory, and kinesthetic modality; and the last, approaching of moving steps from the easiest level to the hardest one. This three learning concepts is enough to apply for children with learning disability in order to overcome them.

Besides, (as cited in Bond, 1984: 230) another phonics approach, advanced by Gillingham and Stillman, has been seen widely used with children experiencing serious reading difficulties. In contrast to methods generally advocated in this study, which deal with letters and sounds found in words, the Gillingham-Stillman method teaches the sounds of the letter and then builds these letters into words. Letter-sound correspondence is established by forming close associations between visual, auditory, and kinesthetic elements.

First the child is taught the name of each letter. This is done by showing a letter card and teaching the child to say the name. Second, sounds are taught. If the child’s production of sounds is faulty, the teacher produces the sound and the child imitates it. Such drill is given only when needed and for no longer than necessary.

Third, a practice drill is given. The teacher says the names of various letters and the child responds with the related sound he has learned. Fourth, practice is given as necessary in tracing, copying, and writing from memory to dictation. In all instances the child says the name of each letter as he writes it.

The procedure progresses through the teaching of letters, elements, and syllables, to work with words. Lessons are highly structured, and reading, spelling, and handwriting are all taught in a unified program. Special materials with a high
degree of phonics consistancy are employed. The student learning by this method is required to do no reading or spelling except with the remedial teacher. (Bond, 1984: 230)

This study uses Gillingham and Stillman method because it applies three perceptions in one time. The method does not only include visual and auditory perception but also tactile and kinesthetic perception.

2.8 Previous Studies

Several books and previous research have been used to support this research which can be related to the topic of this research. Researchers in medicine Shaywitz, et al. (1992) states that “dyslexia and ‘learning disabilities’ may not be medical conditions but simply the lower end of a normal distribution of abilities” (as cited in Smith, 2004:303). Lately, most of researchers did their research about treatment, learning process, etc, using quantitative method.

The result of Boets and De Smedt (2010:183-191) research revealed that children with dyslexia were less accurate and slower in single-digit arithmetic, particularly in multiplication. Furthermore, Boets and De Smedt (2010:183-191) conducted a research entitled Single-digit Arithmetic in Children with Dyslexia concerning with arithmetic disorder. He surveyed 13 children with dyslexia. Boets and De Smedt (2010:183-191) gave multiplication and subtraction tasks by using retrieval and procedural strategies. Their finding revealed that children with dyslexia were less accurate and slower in single-digit arithmetic, particularly in multiplication.

Similar to Boets and De Smedt, Letchumy (2008:115-139) conducted a research entitled “DisleksiadalamKonteksPembelajaran Bahasa di Malaysia” using qualitative approach. He surveyed 20 students on fifth grade in SekolahKebangsaanSerdang which suffered from reading disorder. He selected those who suffered from dyslexia traits using dyslexia syndrome theory (Levinson: 1994) then finally find 7 subjects suffered from the syndrom. After he got seven subjects, he gave the subjects some tests, such as reading, recall, write and arithmetic based on his instructions. Letchumy used Jordan Writing Screening Test (JWST) (1977:162) and Jordan Oral Screening Test (JOST) (1977:159) as the instrument. Those are to
diagnose the subjects’ reading level. As the result, there are two types of dyslexia in the reading aspects of Malay Language; visual dyslexia and auditory dyslexia.

A further research, which was not quite similar to those above was also conducted by Penney, et.al. (2008:263-281) It was entitled “Phonological Processing Deficits and the Acquisition of the Alphabetic Principle in A Severely Delayed Reader: A Case Study”. They surveyed a student, TM, who could not tap syllables in words, had difficulties in producing rhyming words and retrieving the phonological representations of words, and could not discriminate many phoneme contrasts. They used Glass Analysis method to analyze their subject’s failure. They discussed how his phonological processing deficits contributed to his reading difficulties.

Dyslexia is not a new issue anymore, but the hottest issue in teaching and learning world. Dyslexia is a disorder of right and left brain connection then cannot process information auditory. People have to learn how to read and write in order to learn other knowledge. Yet, reading, writing, doing something according to direction, and speaking are not as easy as others because language disorder is caused by no good quality connection between their right and left hemispheres. Besides, there are also so many famous figures that have dyslexia; Albert Einstein, Leonardo Da Vinci, Michael Faraday, and Muhammad Ali are the examples (Practical Strategies for Living with Dyslexia, 2001:8). Thus, labeling dyslexic children mentally retarded is completely wrong since both parties have similar learning problems. The phenomenon of dyslexia is interesting to uncover, to find out the types and characteristics of difficulties on language learning and the methods that are applied to overcome the difficulties.

There are similarities between three previous studies with this study. From Boets and De Smedt research, this first previous study researched about arithmetic disorder and the differences are that that surveyed thirteen children and used retrieval and procedural strategies. The second previous study was about reading disorder of elementary student using Levinson theory and the difference is that that used quantitative approach and did not use perception theory of Lerner. The last previous study was about reading disorder and the difference is that used Glass Analysis Method (as cited in Abdurrahman 2003: 218) whereas this study used Gillingham and Stillman Method (1997).