

Phonological awareness and quick naming of developmental dyslexia in Sekolah Dasar Inklusif Pantara, Jakarta

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Abstract – The weak phonological awareness and slow reaction time in word identification is a disorder that dyslexic people have in reading (Wolf and Bowers, 1999). Therefore, this study will investigate the ability of phonological awareness, rapid naming and reading ability of people with dyslexia. The subjects consisted of 4 children aged 7-8 years of dyslexia in Sekolah Dasar Inklusif Pantara, Jakarta. The four dyslexic children were compared to the control group (20 children from Kwitang 8 PSKD Pancoran Mas, Depok, who had the same age and gender as dyslexic children). The research used quantitative method with case study control design.

The study was conducted with three experiments, namely: reading test, counting the number of syllable, and fast-track test. The first experiment consisted of 100 words (simple words, digraphs, diphthongs, and consonant clusters). The second experiment consisted of 48 words (24 words with illustrations and 24 words with three syllabics). All words are from the 10,000 words that have the highest frequency in the Indonesian linguistic corpus. The third test is 50 RAN letters (Pennington et al., 2001). Results showed that persons with dyslexia had a lower ability than the control group on all three tests. Dyslexic children tend to perform sound recovery, eliminate phonemes and swap words with non-words and slow reaction times. Based on the results obtained, 2 dyslexic children data support double deficit hypothesis Wolf and Bowers (1999) because dyslexic children show phonological deficits and rapid naming deficits.

Keywords: phonological awareness, fast naming, reading, dyslexia

1. Introduction

Developmental Dyslexia is a specific learning disability that is motivated by a neurobiological state (dyslexiaida.org). The word dyslexia comes from Greek, *δυσ* (dis) ie difficulty and *λέξις* (lexia) is the word (Wagner, 1980). According to Lyon and Shaywitz (2003) the learning disability experienced by dyslexic children is characterized by the difficulty of accurately recognizing the word and the ability to spell and weak coding. Such difficulties are thought to be derived from phonological disorders related to cognitive abilities and the effectiveness of classroom instruction. In addition, the disturbance experienced also affects the ability to read, thus inhibiting the development of vocabulary in children.

Children who have been established as dysphicians generally show difficulties in recognizing and remembering sounds, difficulty in recognizing rhythm, reading reversed letters / words, removing and adding sounds, difficulty in spelling words that have complex syllables, difficulty remembering words new words, word exchanges, slow reading and no reading interest (Reid, 2011, p.11). Due to these difficulties, children who exhibit dyslexic disorder are often considered ignorant, lazy to learn and become victims of abuse (Hurford, 1998, p.34).

Examples of reading errors that dyslexic children make are converting to <d>, <p> to <q>, <u> being <n>, <m> becoming <w>, and <s> being <z > (Hermijanto et al., 2016; Solek and Dewi, 2015, pp. 4, Al-Shidhani, Arora (2012) Atmajaya (2016) also found dyslexic children read 'in' to 'in'. In this case it appears that dyslexic children exchange [m] to [n] .In French speakers, Maïonchi-Pino, Magnan and Ecalle (2010) find dyslexic children to exchange [m] to [w], [p] to [d] or [b] and [t] become [s]. Based on these errors it appears that the dyslexic child made a mistake in naming the letters and the sounds.

In addition to sound exchange, Maïonchi-Pino et al. (2010) also found dyslexic children more easily read KV (consonant-vowel) syllables than syllabic KKV (vowel-consonants) or KVK (consonant-consonants). Atmajaya (2016) also found that the pattern of word structure changes that occur in dyslexic children tends to be deviations in words that are more than two syllables. Dyslexic children tend to reduce the number of syllables such as: 'request' [məmɪnta] is read 'request' [mɪnta], and 'other' [oðə] is read 'laya' [laja].

Based on the performance of the syllable, dyslexic children show limitations in recognizing syllables. Unlike normal children in general. Based on the findings of Treiman and Baron (1981), 7-year-old American children are able to correctly count the number of syllables (100% true), such as counting the number of syllables in the word rabbit (rabbit), where normal children can count syllables well. Similarly, Cossu, Shankweiler, Liberman, Katz and Tola (1988) found that normal Italian children (7 years old) could count the number of (100% true) syllables in two- and three- syllable words such as gatto (cat) melon (melon), termometro (thermometer).

Starting from the errors of dyslexic children, it appears that dyslexic children have a weak phonological awareness. Phonological awareness disorders are generally regarded as major deficits in reading (Brady and Shankweiler (1991); Catts (1989),

1996; Fletcher et al., 1994; Stanovich and Siegel (1994); Wagner and Torgesen (1987); Wolf and Bowers (1999) see in Catts, Gillispie, Leonard, and Miller (2002)). Phonological awareness is the conscious ability of detecting and manipulating sounds of language (Wagner and Torgesen, 1987), for example, counting the number of syllables, the child is able to identify different words but has the same or similar sounds, such as: sweet, seat, street (Goswami, see in Brunswick et al., 2010). In addition, the child is able to determine the number of phonemes in simple words, for example: captain consists of 6 phonemes (Goswami, 2010, p.28).

Wagner and Torgesen (1987) also assert that the inability to understand sounds in the syllables can cause phoneme changes as sound is heard. The change is a phonological process. Phonological processing capabilities include weak phonological memory capacity and fast naming. Rapid naming is a naming process involving storage subprocesses, searching and retrieving sounds / words in memory and fast speech production (Denckla and Rudel (1974), see in Wolf and Bowers, 1999). The naming capability is based on cognitive processes such as visual perception, auditory perception, and memory (storage, preservation (preservation), and calling). Thus, when the phonological memory is weak, the encoding of sound representations in short-term memory is disrupted, as well as the storage of the sound representation in long-term memory.

Based on the limitations of dyslexic children, Wolf and Bowers (1999) classify phonological disorder and rapid naming of dyslexia in three types: 1) if the dyslexic child has difficulties in phonological, but good fast naming ability (same as the control child), then the child dyslexia is included in the category of phonological deficits; 2) if the dyslexic child exhibits good phonological ability, but indicates a rapid naming deficit, the dyslexic child is included in the rapid naming deficit; 3) if the dyslexic child has a phonological deficit and a weak, weak naming, then the child has a double deficit. This has been found in 11 children (Portuguese) of 22 children studied by Araújo, Pacheco, Faísca, Petersson, and Reis (2010) in which the dyslexic children studied had phonological disorders and rapid naming disorders in reading. The double deficit hypothesis in dyslexic children is defined as a phonological processing disorder and rapid naming disorder that affects reading ability (Carmen, 2007; Gibson, 2006; Colbert, 2005; Miller, 2006; Vukovic and Siegel, 2006).

Based on the above description, this study will investigate the ability to read, phonological awareness and the rapid naming of dyslexic children. In addition, the study is also expected to contribute to the double deficit hypothesis, the phonological deficit hypothesis, and the rapid naming deficit hypothesis. The results of this study are expected to help therapists, teachers, parents and researchers dyslexia so that dyslexic children can get treatment as early as possible.

2. Method

The research was conducted by quantitative method. The researchers calculated the true number of each test submitted to the subject of the study. Thereafter, the correct answers of each dyslexic child and each control group were compared in the SPSS program by using an independent t-test comparison. 24 children participated in the

study, among which were 4 dyslexic children of 2 males and 2 females. Dyslexic children come from SD Inclusive Pantara, Tebet, Jakarta. Each dyslexic child is given initials D1, D2, D3, and D4. D1 male, age 7 years, IQ = 92; D2 are male, 8 years old, IQ = 92, female D3, IQ = 96, and DD are female, 9 years old, IQ = 92). The inclusion criteria for dyslexic children are already attending school or over 7 years of age, living in urban areas, already diagnosed as dyslexic, and a minimum of senior secondary education. 20 control children came from SD Kwitang 8 Pancoran Mas, Depok. The 20 children consisted of 10 men and 10 women, ages 7 to 8. The inclusion criteria for control children are not having any psychological disturbance, have attended school, minimum parenting education of SMA.

The test is done in each school. For dyslexic children, the test is performed in the psychologist's room, Pantara Inclusive SD. The test was conducted in April 2017. For control children, the tests were conducted in two places, namely the library and the School Health Unit of SD Kwitang 8 PSKD Pancoran Mas, Depok. The tests were conducted from April to May 2017. Each dyslexic child had an IQ test, and overall, IQ scores of dyslexic children fit the established inclusion criteria, i.e. between 91-100 (Wechsler scale). For control children, intelligence tests were conducted on May 29, 2017 by an integrated clinic of the University of Indonesia's Faculty of Psychology. The children chosen are children who have an average level of intelligence and above average.

Experiment 1 (Reading)

100 words read by child dyslexia and also control group. The words chosen for this test are taken from the 10,000 words that have the highest frequency in the Indonesian linguistic corpus (search engine). Selected words are divided into 4 types: simple word (divide), digraph (only), diphthong (only), and consonant cluster (scheme). Each word is printed in the form of a card. Each child is asked to read every word after hearing the instruction (tap mark) to start reading. Time from start tapping until child starts reading count. The remarks obtained when reading are recorded. The recording device used by the author is Sony ICD-PX440 Digital Voice Recorder 4 GB.

Experiment 2 (Phonological Awareness)

Forty-eight (48) words are taken from the Indonesian linguistic corpus of Indonesia in 2013 which has the highest 10,000 word frequency. The list of words is composed of 24 words illustrated (12 simple words and 12 consonant clusters), 24 three syllabic words (12 simple words and 12 consonant clusters), e.g. Baby, drama, independence, president. The list of words is read by one of the BIPA teachers of the Faculty of Cultural Sciences and recorded. Children are asked to listen to the words heard from the recordings, then the children are asked to count the number of syllables from every word they hear. Children clap their hands twice after hearing a two-syllable word (e.g. baby, coffee, cat, and clapping three times after hearing a three-syllable word (e.g. flag, woman).

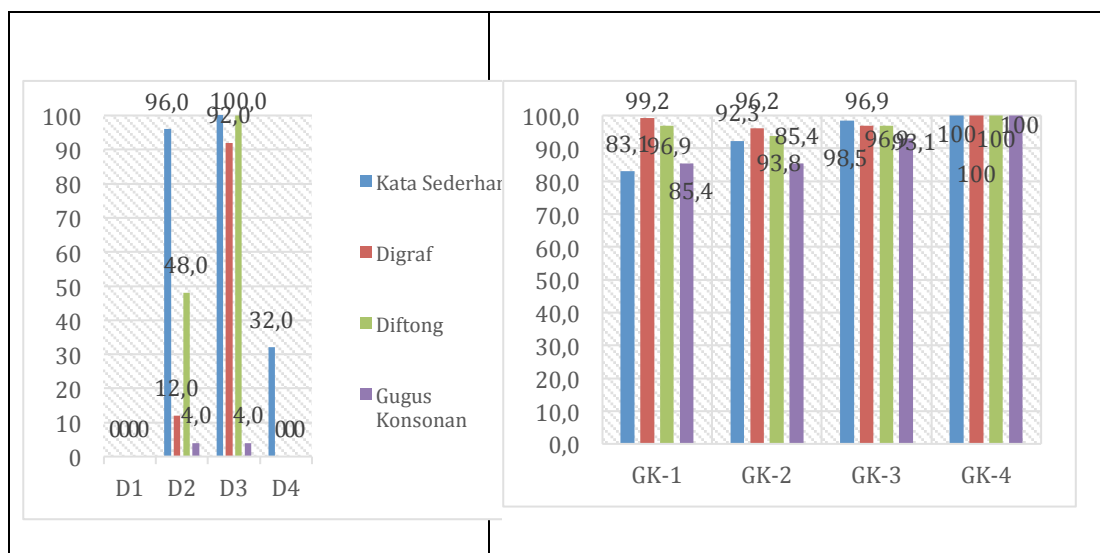
Experiment 3 (Quick Naming)

Rapid naming test or referred to as RAN (Rapid Automatic Naming) test is a type of test used to determine the lexical ability and time required since the instruction sign starts until the child begins to read. The RAN test consisted of 50 stimuli according to the RAN test done by Pennington et al. (2001), which is 5 letters that have the highest frequency (according to research conducted by Pennington et al (2001) presented at random as many as 10 times in one card. Child is given a card consisting of a series of letters <a>, <d> , <o>, <s>, <p>, <s>, <o>, <d>, <a>, <p> The child is asked to name the row quickly after hearing the tap as a start sign. tap until the child starts to say the letters are calculated. The same thing is done on each line / card.

3. Results and Discussion

a. Ability to read

In reading the word (see diagrams 1 and 2), the percentage of reading ability of the first dyslexic child (D1) is 0%, the second dyslexic (D2) is 99.6% (simple word), 12.0% for digraph, 48% for diphthong, 4.0%, reading ability of third dyslexic (D3) children when reading simple word is 100%, digraph 92%, 100% diphthongs and 4.0% consonant cluster, For fourth dyslexic child (D4), simple word reading ability is 32%, digraph 0%, 0% diphthongs, and 0% consonant clusters. Based on the Anjarningsih (2015) study the sequence of normal children's reading abilities starts from simple words, then diphthongs, digraphs, after which consonant clusters. In accordance with these findings, dyslexic children appear to have the same ability sequence. The order of reading ability of first dyslexic (d1) and second (D2) children starts from simple words, then diphthongs, then digraph, after which consonant cluster. In contrast to third dyslexic children, the order of reading ability of third dyslexic child (D3) is started from simple word (same ability as diphthong), then digraph and consonant cluster. The fourth dyslexic child (D4) is also the easiest to read simple words, but is unable to read digraphs, diphthongs and consonant clusters. Dyslexia reading ability can be seen in the picture below:



| | |
|---|--|
| Figure 1. Diagram of reading ability of dyslexic children | Figure 2. Figure 1. Diagram of reading ability of control group. |
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At the time of reading, dyslexic children make reading mistakes such as converting words into meaningful words and meaningless words. Such errors are like swapping sounds, for example 'smile', the second dyslexic child mentions *serum* [sərŪm] and third dyslexic child mentions *senyp* [səŋŪp]. In addition, dyslexic children change the word as a whole as a fourth dyslexic child reads a smile with *lepa* [ləpa]. When reading a word with a consonant cluster, the second dyslexic child reads the word slogan with *molen* [molən], the third dyslexic child (d3) reads it with *slokan*, and the fourth dyslexic child (d4) reads it with the cl kl [klək]. Dyslexic children also remove phonemes and add phonemes such as peace to read and often read frequently.

Dyslexic children who exchange sounds are second (D2) and fourth (D4) dyslexic children. The sounds that the second dyslexic child exchanges are [a] to [u], [g] to [j], [j] into [a], [t] becoming [b]. The fourth dyslexic child converts [b] into [p], [t] becomes v], [g] becomes [p], [d] becomes [p], [d] becomes [p], [m] becomes [n] , [k] becomes [j], [f] becomes [p], [t] becomes [b], [ŋ] becomes [j], [ŋ] becomes [w], [w] becomes [j]. Based on the exchange of dyslexic children tend to swap sounds to make noises and noiseless sounds to sound, other than that nasal sounds changed to semi vowel. Based on the exchange of sounds performed, these characteristics are in accordance with the findings of Hermijanto et al. 2016; Dewi, 2015, p. 4; Al-Shidhani, Arora (2012). In addition, the ability of dyslexic children simplifies words and converts words into pseudowords according to findings from Atmajaya (2016). The exchange of sounds and changing the length of the word and converting the word into pseudo-words may be due to weak orthographic abilities and weak phonological processing.

b. Phonological Awareness

Based on comparisons made with independent t-test, dyslexia A and control group showed significant differences. Children with dyslexia A have lower ability than control group in counting syllables in word disyllabic (p = 0,005) and three syllabics (p = 0,005); Dyslexic children B have significant differences with control group when counting syllables on three syllabics (p = 0,000); D Dyslexic children have a significant difference in counting the number of syllables in the word disyllabic (p = 0.005). When counting the number of syllables, dyslexic children who succeeded in counting the number of syllables in a word consisting of two syllables (100% true) were the first, second and fourth dyslexic children. For words consisting of three syllables, the first and fourth dyslexic children have the same ability with a true percentage of 91.7%.

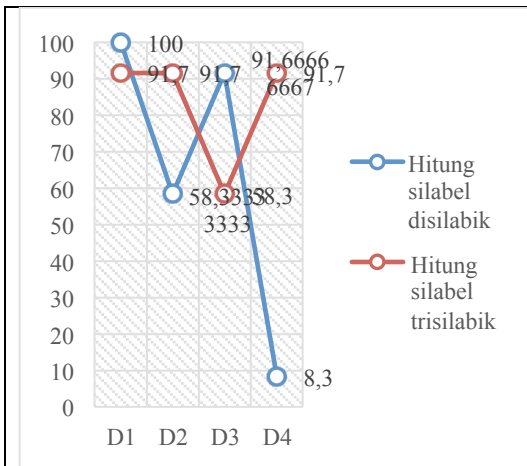


Figure 3. Diagram of counting ability to syllable number of bi-syllabic and three syllabics of dyslexic child

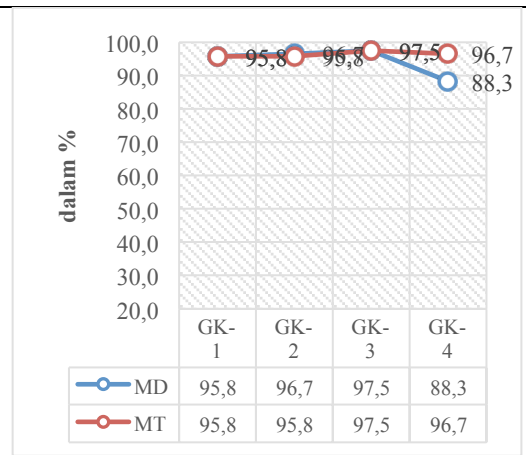


Figure 4. Diagram of counting ability to syllable number of bi-syllabic and three syllabics of Control group.

Based on the word type, on the simple word the first dyslexic child (d1) and second dyslexic child (D2) can calculate the number of syllables by correct answer (100%), for third dyslexic child (D3) can count the number of syllables by correct answer 75%, and fourth dyslexic child (D4) can answer correctly as much as 45%. In the task of counting the number of syllables in the consonant cluster, the first dyslexic child (D1) can answer with a success rate of 91%, the second dyslexic (D3) 45.8%, third dyslexic (D3) and fourth dyslexic (d4) %.

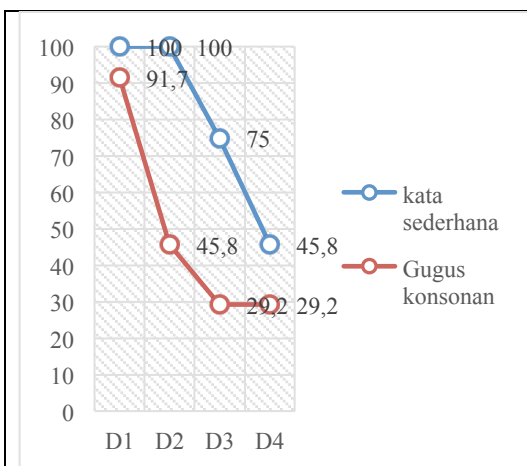


Figure 5. Counting Skill Diagram of number of syllable in simple words and words with consonant cluster

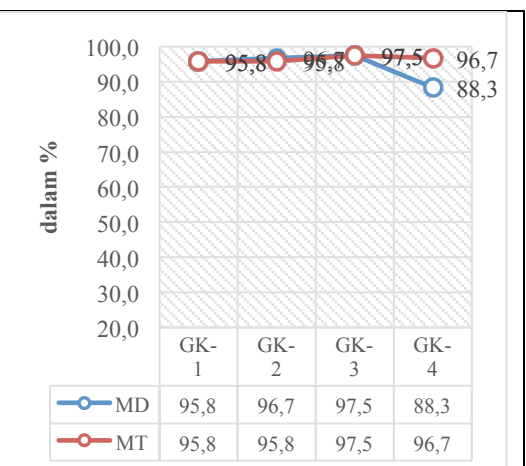


Figure 6. Counting Skill Diagram of number of syllable in simple words and words with consonant cluster by control group

c. Fast naming Letters

In reading the letters (see Figures 1 and 2), the percentage ability to name the letters by the first dyslexic child (d1) is 74%, the control group A is 99.6%, the second dyslexic (D2) is 88%, the control group obtains 98% , the third dyslexia (d3) is 100%, the control child also gained 100%, and the fourth dyslexic (d4) is 74%, but the control group is 100% (see diagrams 1 and 2). Based on the comparison done by using independent t-test, the results show that the first dyslexic child (D1) differed significantly with the control group (mean D1 = 37.00; mean GK-1 = 49, SD = 0.447, p = 0.000) , mean D2 = 37.00, mean GK = 44.00, SD = 0.894, p = 0.005; P = 0.282), third dyslexic child (D3) (mean D3 = 34.00; mean GK = 38.00, SD = 0.707, P = 0.007), fourth dyslexic child (D4) (mean D4 = 37.00; mean GK = 50.00, p = 0,000). Thus it can be seen that dyslexic children 1, 2 and 3 have significant differences with their control group, or have lower ability than their respective control group.

d. Reaction Time

The reaction time of the first dyslexic child (D1) while reading the letter is 4.80 seconds (control group 1.15), whereas the reaction time of reading the word is not found because the dyslexic child can not read the word (control group 0.78 seconds) and has worked hard reading, but not able. The reaction time of the second dyslexic child (D2) while reading the word is 5.88 seconds (control group 0.69 seconds), while the reaction time of mentioning the letter is 3.44 seconds (control group 1.25 seconds). For third dyslexic son (D3), reaction time while reading the word is 0.68 seconds (control group 0.59 seconds), while reaction time says the letter is 2.15 seconds (control group 0.59 seconds). For fourth dyslexic son (D4), reaction time when reading the word is 8.6 seconds (control group 0.46 seconds), while reaction time for reading letters is 3.4 seconds (control group 0, 8 seconds).

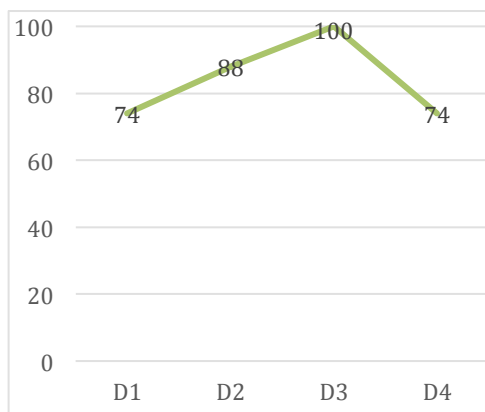


Figure 7. Alphabet RAN Ability diagram of dyslexic child

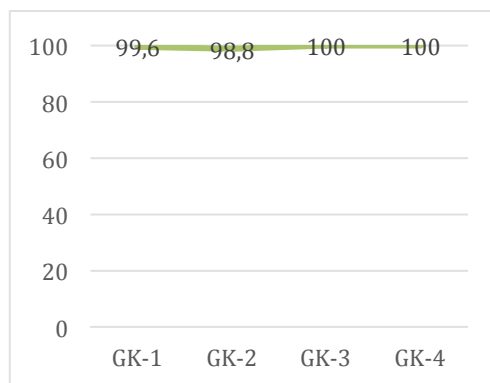
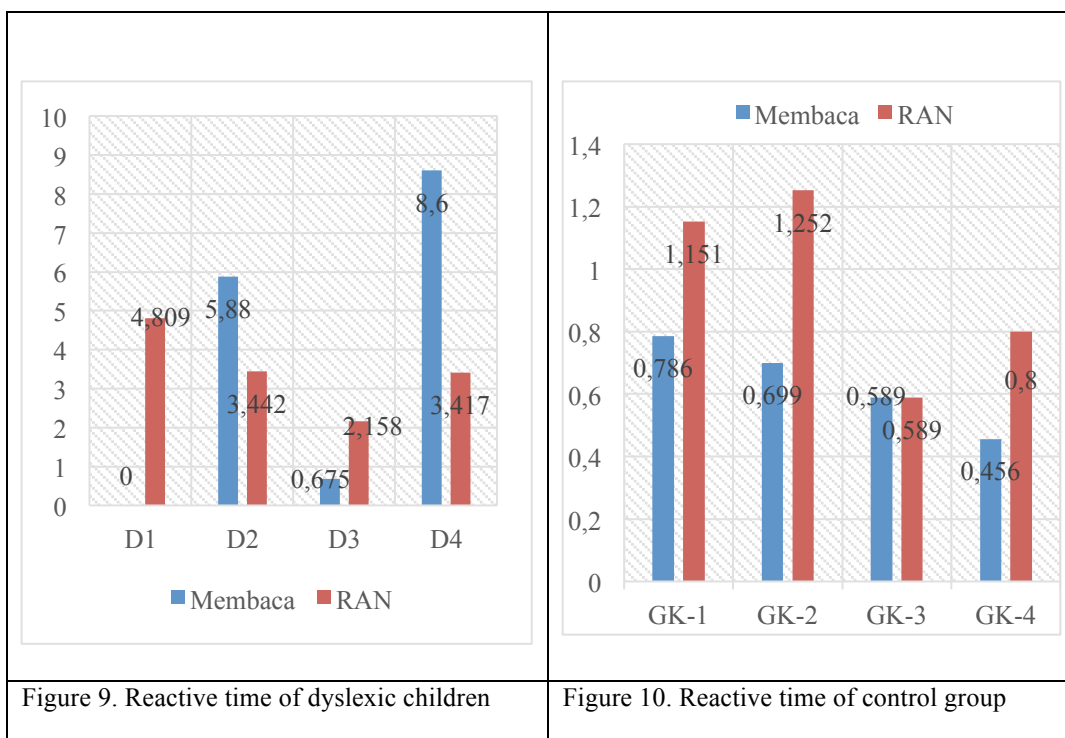


Figure 8. Alphabet RAN ability diagram of dyslexic child

Based on the reaction time of each dyslexic child, the ability to mention letters by the first dyslexic child (d1) with the control group has a difference of 3.65 seconds, the difference between the second dyslexic child (D2) in reading the word is 5.181 seconds, while when naming the letters, 2.19 seconds. For third dyslexic child (D3), there was difference of reaction time 0,089 second while reading, while when to name difference of reaction time is 1,569 seconds. For the fourth dyslexic child (D4), found the difference of reaction time 8.114 seconds while reading, while when naming the letter found difference of reaction time 2,167 second.

Based on the above discussion, dyslexic children look to have different abilities. The first dyslexic child (d1) is unable to read, but is able to calculate the number of syllables well. When asked to mention the letters, D1 has a success rate of mentioning letters as much as 74% (average control group 99.6%), and requires reaction time of 4.8 seconds while the control group only requires an average of 1.1 seconds in the mention alphabet. Based on these abilities, child D1 may have a rapid naming disorder in reading, but has a good phonological awareness. Inability to read may also be due to weak orthography skills given that D1 tends to exchange letters such as switching to <p>, <p> to <d> and to <d>.



The second dyslexic child (d2) is incapable of reading words that contain digraphs, diphtheses and consonant clusters well. D2 is also unable to calculate the number of syllabic and trisyllabic syllables, nor is it able to calculate the number of

simple syllables and words with consonant clusters. When reading a word, D2 takes 5.5 seconds (control group average 0.6 seconds) and reads 3.4 seconds (group control average 1.1 seconds). Based on the characteristics of reading, D2 simplifies the word as when read *kalu*, the lake is read and the knife is read by a knife. In addition, D2 also swap words into nonwords, like *taufik* read *delika*, morally readable *raka* and *brutal rama*. Based on the capabilities possessed by D2, D2 is likely to have a double deficit for not being able to read well, have a weak phonological awareness, and have a much lower ability in fast naming than the control group. In accordance with the hypothesis proposed by Wolf and Bowers (1999) that when a child with dyslexia has a weak phonological awareness and weak weak naming, the dyslexic child has a double deficit.

The third dyslexic child (d3) has difficulty only on words containing consonant clusters. D3 immediately says do not know when reading a word that has a consonant cluster. Based on the ability to calculate the number of syllables, D3 has the ability to calculate the number of syllables in the simple word 75% and 29% consonant clusters, disyllabic and three syllabics 29%. The rapid naming capability shows that D3 does not have nearly the same reaction time as the control group at the time of reading the word, but when reading the letter D3 takes more than 2.1 seconds or looks slightly longer than the control group (0.5 seconds). Thus, based on the ability to read D3, the incompetence of reading consonant clusters matches the abilities of normal children. Anjarningsih (2015) found that children aged 7-8 years showed difficulty reading words with consonant clusters. The difficulty is closely related to the process of child growth. In addition, when counting the number of syllables, D3 also shows difficulty in counting the number of syllables in words containing consonant clusters.

The fourth dyslexic child (D4) is unable to read. The difficulty of reading is characterized by several types of errors, namely: swapping letters, such as from [read] rays [pari], had been *tabi* [tabi], and songs [songs] read *lapu* [lapu]; swapping the whole word with pseudo-words, for example, can be read [hurry], toilet [toilet] read *totek* [totek]; product [prodŪ?] is read *sasi* [sasi], and classical [klasi?] is read *nutmeg* [pala]. Based on the ability to calculate the number of syllables, D4 can not calculate the number of syllables in the word disyllabic, but able to calculate the number of syllables in three syllabics word. In addition, the ability to calculate the number of syllables in simple words is 45% and consonant clusters by 25%. At the time of reading the word, the time of the D4 quick naming reaction is 8.6 seconds (control group 0.4 seconds), while reaction time mentions the letter is 3.4 seconds (control group average 0.8 seconds). Based on the ability of D4, dyslexia d4 may have a double deficit (Wolf and Bowers, 1999) because it has weak phonological awareness and a much faster naming capability than the control group.

4. Conclusion

Based on the above discussion, it can be concluded that dyslexic children have different abilities and disorders. Every child of dyslexia has its own uniqueness. Based on read performance, syllable awareness and fast naming of four dyslexic children tested, there

are two dyslexic children (D2 and D4) who have a double deficit, which has a phonological awareness deficit and a weak, weak naming. One dyslexic child (D1) shows a rapid naming deficit. These results support the Wolf and Bowers (1999) hypothesis in classifying the deficits of dyslexic children and findings from Araújo, Pacheco, Faísca, Petersson, and Reis (2010). From reading performance to dyslexic children, these results are in accordance with Atmajaya (2016) because it finds several types of errors in dyslexic children such as swapping letters, swapping words into non-words, simplifying words, and eliminating phonemes.

References

- Al-Shidhani, T. A., Arora, V. (2012). "Understanding Dyslexia in Children through Human Development Theories". *Sultan Qaboos University Medical Journal*, 12(3), 286–294.
- Atmaja, Y. D. S. (2016). *Kemampuan Membaca Pada Anak Disleksia Di Sekolah Inklusif Galuh Handayani Surabaya Kajian Psikolinguistik*. Skripsi, Universitas Airlangga.
- Anjarningsih, H. Y. (2016). "Characterising the reading Development of Indonesian Children". Kolita 14. Unika Atma Jaya.
- Alexander-Passe, N. (2013). "Dyslexics". Retrieved from <http://etebookcentral.proquest.com>
- Araújo, S. et al. (2010). "Visual rapid naming and phonological abilities: Different subtypes in dyslexic children". *International Journal of Psychology*, 45(6), 443-452.
doi:10.1080/00207594.2010.499949
- Carmen, L. E. (2007). "Evaluation of the double-deficit hypothesis subtype classification of readers in spanish. *Journal of Learning Disabilities*". 40(4), 319-30. Retrieved from <http://search.proquest.com/docview/194223905?accountid=17242>
- Catts, H. W. et al. (2002). "The role of speed of processing, rapid naming, and phonological awareness in reading achievement. *Journal of Learning Disabilities*", 35(6), 509-24. Retrieved from <http://search.proquest.com/docview/194218655?accountid=17242>
- Cossu, G., et al. (1988). "Awareness of phonological segments and reading ability in Italian children". *Applied Psycholinguistics*, 9(1), 1-16.
doi:10.1017/S014271640000424Fletcher et al., 1994;
- McDougall, S., Brunswick, N., & de Mornay Davies, P. (2010). "Reading and dyslexia in different orthographies: An introduction and overview". In N. Brunswick, S. McDougall, & P. de Mornay Davies (Eds.), *Reading and dyslexia in different orthographies* (pp. 3-21). New York: Psychology Press
- Hermijanto, O. B., Valentina, V. (2016) *Disleksia: Bukan Bodoh, Bukan Malas, tetapi Berbakat*. Jakarta : PT Gramedia Pustaka Utama
- Hurford, D. M. (1998). "To Read or Not to Read". A Lisa Drew Book/Scribner. New York.
- Lyon, G. R., Shaywitz, S. E., & Shaywitz, B. A. (2003). "A definition of dyslexia". *Annals of Dyslexia*, 53(1), 1-14. doi:10.1007/s11881-003-0001-9
- Maionchi-Pino, N., Magnan, A., & Écalle, J. (2010). "The nature of the phonological processing in French dyslexic children: Evidence for the phonological syllable and linguistic features' role in silent reading and speech discrimination". *Annals of Dyslexia*, 60(2), 123-150. Retrieved from <http://remote-lib.ui.ac.id:2059/stable/23764641>
- Pennington, B. F., Cardoso-martins, C., Green, P. A., & Lefly, D. L. (2001). "Comparing the phonological and double deficit hypotheses for developmental dyslexia". *Reading and Writing*, 14(7-8), 707-755. doi:http://dx.doi.org/10.1023/A:1012239018038
- Reid, G. (2011). "Special Educational Needs" : *Dyslexia 3rd Edition (3)*. London, GB: Continuum. Retrieved from <http://www.ebrary.com>.
- Solek, P., Dewi, K. (2015). *Dyslexia today, Genius Tomorrow*. Bandung, Indonesia: Dyslexia. Association of Indonesia Production

- Siddaiah, A., Venkatesh, S. K. (2014). “Phonological awareness and reading in children with and without dyslexia in english and kannada”. *Journal of Psychosocial Research*, 9(2), 369-378. Retrieved from
<https://search.proquest.com/docview/1702092631?accountid=17242>
- Treiman, R., & Baron, J. (1981). “Segmental analysis ability: Development and relation to reading ability”. *Reading research: Advances in theory and practice*, 3, 159-198. (Wagner, 1980).
- Wagner, R. K., & Torgesen, J. K. (1987). “The nature of phonological processing and its causal role in the acquisition of reading skills”. *Psychological bulletin*, 101(2), 192.
- Wolf, B. (1999) Wagner, R. K., & Torgesen, J. K. (1987). “The nature of phonological processing and its causal role in the acquisition of reading skills”. *Psychological bulletin*, 101(2), 192.