Applying Rapid Automatized Naming (RAN) To A Single Case Of Dyslexia In A Bilingual Child

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Abstract

This study presents the use of the Rapid Automatized Naming Intervention Model (RAN) in the case of a boy aged 6 years and 7 months, who is diagnosed with dyslexia and Attention Deficit Disorder. The focus of RAN therapy is to increase the speed of naming letters and combining words so that the child's reading speed improves and his phonological awareness, speed of automated naming, and working memory are improved. This study uses a single case design. The intervention was carried out in twenty-one-hour sessions for two months. The uniqueness of this case is that the child is bilingual and fluent in both Indonesian and English so the RAN intervention provided needs were modified. After the intervention was carried out for two months, the test results showed an increase in the mean Rapid Automatized Naming score by 25%. The characteristics of a child's dyslexia, especially the difficulty of reading quickly, were reduced and the child was able to adapt well according to their academic needs. It can be concluded that modified RAN therapy for bilingual children is effective in helping children with dyslexia, especially those who have disorders at the sublexical level.

Keywords: dyslexia disorder, rapid automatized naming, RAN, bilingual children.

Introduction

In a world where information spreads at breakneck speed, many people may find it difficult to access and properly interpret it. During an online study in the pandemic era, because the child must be exposed to gadgets to learn, many children are forced to skip some essential learning processes, which leads to confusion and even delayed growth in cognitive, language, psychosocial, and other areas. This sadly happened to many children, especially this one child who later became the subject of this study. A child with an initial of "A", who is currently 6 years 7 months old.

Speaking of cognitive, language, and psychosocial behavior in children. According to Piaget's theory of cognitive development, the process of human cognitive growth can be split into four stages: The first stage is Sensorimotor Period; this stage of cognitive development lasts from 0 to 2 years of age. The newborn creates a grasp of the environment at this stage by integrating sensory experiences (such as seeing and hearing) with physical and motor actions and is therefore called "sensorimotor". The second stage is called the Preoperational Stage; Cognitive development at this stage lasts from age 2 to 7 years. In this stage, the child begins to represent the world with words, images, and images. These words and pictures show an increase in symbolic relationships and beyond the relation of sensory information and physical action. The third stage is Concrete Operational Stage; The concrete operational stage lasts approximately ages 7 to 11 years old. At this stage, children begin to think logically about concrete events and classify objects into different forms. Children begin to see many aspects of a particular situation. The ability to classify something already exists, but it has not been able to solve problems abstractly. The fourth one is called the Formal Operational Stage; The formal operational stage is in the age range of 11 years until adulthood. This phase is also known as adolescence.

Teenagers think in a more abstract, logical, and idealistic way. At this stage, a person has started to think about concrete experiences and could think more abstractly, idealistically, and logically.

In terms of language, a child also learns language in a very unique way. Language Development at the age of 6 years 7 months, specifically speaking, children are considered to enter middle and late childhood. During middle and late childhood, children have made great progress in vocabulary and grammar. When children enter elementary school, children begin the process of reading and writing. Some of the characteristics of the language development of children aged 6 years 7 months (Santrock, 2007) are first called Vocabulary and grammar; The way children think of words changes during middle and late childhood. Children become less attached to actions and perceptions associated with words, and children become more analytical in using words. Secondly, Metalinguistic Awareness; Metalinguistic awareness refers to language knowledge where children think about language, understand what words are, and define them. Thirdly, Reading; From birth to level one Elementary School—Children master the prerequisites for reading. Many children learn left-to-right reading movements and reading order, how to identify letters and the alphabet, and how to write their names. Children also learn to read the words that appear on road signs. In levels one and two of Elementary School—At this level, the child begins to learn to read. By doing so, they also acquire the ability to sound words, translate letters into sounds and mix sounds into words and sentences. Level two and three Elementary School—Children are more fluent in repeating words, reading, and forming sentences. The demands of reading sometimes drain a child's stamina so that the child is exhausted before absorbing the essence. Level four to eight—Children have to read to understand the information displayed from various reading sources. Senior High School––Many students have become reliable readers, students can understand the material very well, and discuss literature and the history of an expert.

In terms of Psychosocial Development, Erik Erikson's psychosocial theory includes eight successive stages throughout life. The stages that occur depend on the results of the previous stages and the successful resolution of each ego crisis is essential for the individual to be able to grow optimally at each stage. There are eight stages of psychosocial development according to Erik Erikson (Riendravi, n.d.) and (Santrock, 2007): The stage of trust versus mistrust; the first stage is the trust versus stage mistrust, which occurs at the age of 0-18 months. In the first year of life, individuals have not been able to carry out several activities independently so trust becomes an important thing. The second stage, namely the stage of autonomy versus shame, occurs at the age of 18 months-3 years. At this age of development, individuals begin to learn a lot such as walking, talking, developing motor and sensory abilities, and are no longer dependent on parents. Individuals begin to strive to achieve autonomy or the ability to do things independently. The third stage, namely the initiative versus guilt stage, occurs at the age of 3-6 years. Along with motor maturity and language development of children, at this age stage children begin to explore their own social and physical environment by playing. The fourth stage, namely the industry versus inferiority stage, occurs at the age of 6-12 years. Children begin to enter a period of formal learning at school. The influence of parents has begun to wane and is replaced by the increasingly important role of teachers and peers for children. The fifth stage is identity versus identity confusion, which occurs at the age of 12-18 years. In this period of development that has entered the adolescent stage, the role of peers is increasingly dominant than parents. A distinctive feature of development at this stage of development is the search for self-identity. Adolescents begin to doubt the values that are believed and adhered to so conflicts often occur when searching for self-identity. The sixth stage, namely the stage of intimacy versus isolation, occurs in early adulthood. At this stage, individuals who enter early adulthood have found their identity so that they are ready to share their lives with others. Individuals in this age

range begin to experience feelings of falling in love and wanting to have a relationship with the opposite sex. The next stage is the stage of generativity versus stagnation. Occurs in middle adulthood. Generativity is the desire to shape and guide the next generation. Generally, at this stage the individual will be active in life tasks such as educating children, transmitting ideas and ideals to the family, achieving work performance, taking part in society, and producing work in any form. And lastly, integrity versus despair stage; The last stage occurs in late adulthood. Everything that happened in the previous phase will affect this phase.

Process of growth is extremely complex, mistreatment towards each child's growth could lead to many possibilities, one of them is learning disorders. Learning disorders have affected many children across the globe. According to research conducted by University College London, up to 10 percent of the population is affected by specific learning disabilities (SLDs), such as dyslexia, dyscalculia, and autism, translating 2 or 3 pupils in every classroom. The review done by academics at UCL and Goldsmiths also indicates that children are frequently affected by more than one learning disability. In Indonesia alone, Riyani T Bondan, Chairman of the Indonesian Dyslexia Association, said that in the world, 10 to 15 percent of school children have dyslexia. With the number of school children in Indonesia at around 50 million, it is estimated that 5 million of them have dyslexia.

Dyslexia is a form of learning difficulties in children related to reading, writing, speaking, and listening activities. Dyslexia includes dysfunction or disturbance in the use of words that affect social relationships with others and affect the learning process at school (Bolhasan, 2009). Dyslexia is defined by WHO as a specific and significant decrease in reading acquisition that is often associated with impaired writing acquisition. This disorder appears in the presence of normal or above-average intelligence (WHO in Petrotto & Carmelo Masala, 2017). Although the diagnosis of dyslexia is often found in boys, research has shown that its effects are experienced by both men and women

with the same intensity (Venton, 2011 & Umphred, 2013). The difficulties that arise vary in each case, and allow for differences in the intensity of the disturbance from one case to another. Problems that appear to arise in dyslexia are difficulties in spelling words, reading quickly, writing words, voicing words in mind, voicing or reading words aloud, as well as understanding what is read. The cause of dyslexia is believed to come from environmental and genetic interaction factors (Peterson, 2012).

There are two types of dyslexia, namely developmental dyslexia and acquired dyslexia. Developmental Dyslexia is present at birth and is caused by genetic or hereditary factors. There is no cure for this type of dyslexia. Not only having difficulty reading, usually, people with dyslexia also experience difficulties in spelling, writing, and several other aspects of language. While second dyslexia, namely acquired dyslexia, is obtained due to disturbances or changes in the way the left brain reads. Some researchers define dyslexia as a condition of processing input or information in a child's brain that is different from processing in a normal child's brain which is often characterized by difficulty in reading that can affect cognitive areas, such as memory, input processing speed, timing ability, cognitive aspects. coordination, and movement control. What can also happen is visual and phonological difficulties.

This study presents the use of the Rapid Automatized Naming Intervention Model (RAN) in the case of a boy aged 6 years and 7 months, who is diagnosed with dyslexia and Attention Deficit Disorder. Rapid Automatized Naming is a process that underlies the speed of recognizing visually displayed language stimuli. The focus of the RAN assessment is to increase the speed of naming letters and combining words so that the child's reading speed improves and his phonological awareness, speed of automated naming, and working memory are improved.

This study uses a single case design. The intervention was carried out in twenty-one-hour sessions for two months. The uniqueness of this case is that the child is bilingual and fluent in both

Indonesian and English so the RAN intervention provided needs were modified. The goal is to assess the child's reading ability and to see whether RAN is effective to use as a reading assessment or not in the context of a private school child in Bali.

Method

Participant

"A" is currently 6 years 7 months old, with the same average height as other children his age with a height of 115 cm and a weight of 21 kg. A is fair-skinned and dressed in a school uniform that is always neat. A's hair is neatly cut above the collar with bangs, and a handsome face is typical of Batam Chinese. A is also friendly, and always greets friends and teachers, and examiners whenever they meet, either calling names and saying good morning in English or saying "Good morning, ms." to the teachers. Initial observations were made when A came to school and played, and underwent learning activities when each studied different subjects until when he came home from school.

Interviews were conducted with A's father offline at school. A's father is also well-groomed and about 175 cm tall and has a thin stature, fair skin, and a handsome face. A's father wore a green polo shirt at the time of the interview, and was friendly and very collaborative in answering the examiner's questions. A's mother, MS, is beautiful and very collaborative in answering the examiner's questions through the online media Zoom. A's mother wore neat casual clothes when the interview was conducted through online media. Several times passed during an interview with A's mother, and A's mother always greeted A and gave instructions for example to eat, or "say hi" to the examiner.

A's mother has worked as a Youtuber since 2014 before she gave birth to A. Currently, A's mother's Youtube channel has almost 1M subscribers and is also active through various social media such as Instagram and Tiktoks. The one who also helped a lot in caring for A was A's grandmother, with the initials AF, but did not participate in the interview due to her limited Indonesian because AF has a limited vocabulary, and speaks mostly Mandarin.

Instruments

Observation is done using several methods: direct/offline observation, interview, and formal and informal tests. Direct/offline observation is used to directly see the report at the beginning as well as the data retrieval process to be processed afterward. The formal test includes five types of tests: Stanford Binet, CBCL, 3D Test (Early Detection of Dyslexia) one of which includes Rapid Automatized Naming (RAN), Vineland Social Maturity Scale (VSMS), and Graphics (DAM, BAUM, HTP). Stanford Binet is used to measure the kid's intelligence level. CBCL is used to measure and identify competencies related to children's emotional and behavioral problems from the perspective of parents/guardians. 3D test (Early Detection of Dyslexia) is used to identify the level of dyslexia disorder. RAN assessment in this 3D test requires the child to mention objects, colors, series of numbers, and letters. Vineland Social Maturity Scale (VSMS) is used to measure individual social maturity. Graphics (DAM, BAUM, HTP) is used to see a picture of personality, and social and cognitive development. The informal test includes a reading test using cards containing pictures and a word written from the picture. This method is used to see the ability to learn new words and or remember words.

Procedure

The supervision of this psychological examination was carried out by Dr. Naomi Soetikno, M.Pd, Psychologist.

Table 1 Intervention

No.	Date	Location	Activities	Duration
1	Monday, 7 March 2022	Grade 1 Class in a private school in Bali	Standford Binet Test	2,5 hours (12.30 PM – 3 PM)
2,3	Tuesday, 8 March 2022	Grade 1 Class in a private school in Bali	General observation of teaching and learning activities	5 hours and 30 minutes (08.30 AM – 02.00 PM)
			VSMS Test	
			CBCL Test filled in by parents	
4	Wednesday, 9 March 2022	Guidance and Counselling Room	Child's interview observation (A)	1 hour (10.00 AM – 11.00 AM)
5			Early Detection of Dyslexia Test	1 hour and 30 minutes (11.00 AM – 12.30 PM)
6	Thursday, 10 March 2022	Guidance and Counselling Room	Father's interview observation (HT)	1 hour and 30 minutes (08.30 AM – 10.00 AM)
7			DAM, BAUM, HTP Tests	1 hour and 30 minutes (04.30 PM – 05.00 PM)
8	Friday, 11 March 2022	Virtual Zoom meeting	Mother's interview observation (MS)	1 hour and 30 minutes (08.30 AM – 10.00 AM)
9	Wednesday, 23 March 2022	Virtual melalui Zoom meeting	Mother's interview observation (MS)	1 hour and 30 minutes (04.00 PM – 05.30 PM)

Intervention

The assessment was conducted in 9 sessions. Each session lasted approximately one hour and 30 minutes. All were conducted offline in the first week of March 2022. The assessment of A which included observations and a series of tests was conducted at a private school in Bali as well as a brief interview with A's father who was conducted at school offline. The interview with A's mother was conducted using an online application, namely Zoom or Whatsapp, due to A's mother's busy schedule. The first sessions were dedicated to the evaluation and diagnosis. The last session was held 12 days after as a further observation.

Data Analysis

The scores of each assessment are presented to measure the level of intelligence so that further evaluation could be conducted later. In a 3D test, A obtained a score of 67.5 on the aspect of the Naming Speed dimension with the criteria of Experiencing a Deficit, a score of 3.4 on the aspect of the Phonological Awareness dimension with the Normal criteria, and a score of 2.0 on the aspect of the Working Memory dimension with the Normal Criteria. Based on the results of the VSMS test by A,

the basic score is 50, the added score is 2, the total score is 57.5, and the social age score is 5.13 which is equivalent to the age of 5 years 2 months, (which is then added by 10), so equivalent to 6 years 0 months and a social quotient score of 109.67. Based on the results of the A test, it was found that the measurement results of A's social vigor were seen from 8 aspects, namely general independence, self-regulation, locomotion, independence for eating and drinking, occupation, socialization, self-regulation independence, and communication. Based on the results of the examination of the SB test kit that had been given to A, it was found that the basal age was 5 years with a ceiling age of 9 years. In the 5-year age category question, A can answer all the questions, in the 6-year age category, A can answer 4 questions. At the age of 7 years, A was able to fill in 3 questions, while at the age of 8 years, A was able to fill in 2 questions. Based on the calculation of mental age, A is equivalent to a child aged 6 years and 6 months with an IQ score of 99 which is included in the average classification based on the third revised Stanford Binet, which means that A's intellectual function is in the average category. Based on the results of the Child Behavior Checklist that has been filled in by A's mother, it is found that A has a total competence score of 40-B which is in the Borderline category range (threshold). In the activity category, competency A is included in the clinical category. This shows that A has problems in daily activities. In the social category, competency A is included in the clinical category as well, which shows that A also has obstacles in social skills. While in the school category, competency A is included in the clinical category, namely that in school competence, A also experiences problems in academics at school. Based on the results of the Child Behavior Checklist that has been filled in by A's mother again, it is found that A's behavior problems are currently in the normal range, A is not seen by his mother as having behavioral problems. In the internalizing category, the results show that in the withdrawal, somatic and anxiety behavior, A is included in the normal category according to the child's age and does not show problems in the above matters. While in the externalizing category, A also

does not show problems in terms of delinquency or aggressiveness, A is in the normal category according to children his age. In the social category, based on the assessment by his mother, A is also included in the normal category as well as in the thinking category, A is included in the normal category and according to children his age. Only in the Attention category, A is included in the borderline or threshold category. Based on the results of the DAM test, it can be concluded that A feels quite safe at the moment, tends to have high aspirations, and likes to fantasize. With high standards, A currently feels inferior, especially in terms of cognitive-intellectual performance. Even so, A does not seem hesitant and quite satisfied with himself and his current environment but longs for more social interaction, friendship, or close friends/siblings.

Results

Based on the results of the psychological examination conducted on A who is almost 7 years old, based on the Diagnostic and Statistical Manual of Mental Disorder-Fifth Edition (DSM-5) the diagnosis is given with the following exposure:

The American Psychiatric Association [APA] (2013) has modified the international diagnostic criteria for learning disabilities. There have been some fundamental changes in the diagnostic criteria. The use of the term "dyslexia" is now suggested only in the clinical field, while the terminology adopted now is "Specific Learning Disorder". Specific learning disorders where reading disorders are classified as specific learning disorders. The use of the term dyslexia is now recommended only in the clinical field. The diagnostic criteria for specific learning disorders are (DSM V): 315 (f81.0) Specific Learning Disorders (Dyslexia):

A. Difficulty learning and using academic skills, as demonstrated by at least one of the following symptoms that have persisted for at least 6 months, despite interventions targeting the difficulty:

1) Inaccurate or slow and difficult word reading (eg, reading a word aloud incorrectly or slowly and hesitantly, often guessing words, having difficulty pronouncing words).

This diagnosis is given with consideration that A has the following criteria, namely:

a) Showing limitations or obstacles in giving letters so that when reading children often hesitate and often guess the word.

b) Having problems in distinguishing the letters that are read (often guesses the word he says)

c) Experiencing a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling skills.

2) Difficulty understanding the meaning of what is read (for example, being able to read text accurately but not understanding the sequence, relationships, conclusions, or deeper meaning of what is read).

This diagnosis is given with consideration that A has the following criteria, namely:

a) Shows limitations when the child finishes reading without knowing the meaning of what he has read.

b) The child does not mention wholly what he read during reviewing.

c) Having problems in reading comprehension when reading a text.

3) Difficulty with spelling (eg, being able to add, remove, or replace vowels or consonants).

This diagnosis is given with consideration that A has the following criteria, namely:

a) Shows significant limitations on the words, reading the words by adding, removing, or replacing the words contained in the text that is read.

b) Shows difficulty when the child gets a complex word, the child will replace the vowels and consonants he reads.

B. Academic skills are substantially and measurably affected and related to the individual's chronological age, and cause significant impairment in academic or occupational performance, or with activities of daily living, as confirmed by standardized attainment measures provided by the individual and clinical judgments provided by the individual comprehensive. For individuals aged 17 years and over, a documented history of learning disorders can replace standardized assessments.

This diagnosis is given with consideration that A has the following criteria, namely:

Constraints in the learning process in terms of reading, affect the academic process. As when understanding the context and meaning of a reading that is read.

C. Learning difficulties are not better accounted for by intellectual disability, uncorrected visual or auditory acuity, other mental or neurological impairment, psychosocial difficulties, lack of proficiency in the language of academic instruction, or inadequate educational instruction.

This diagnosis is given with the consideration that A experiences the following criteria, namely: A does not experience intellectual disability and can participate in learning processes such as science and mathematics, and children only show problems in the process of reading activities.

The evaluation was carried out on A who was 6 years and 7 months based on a psychological examination Dyslexia Early Detection Test. Based on the examination that has been done, A has a diagnosis of mild dyslexia. Judging from the details of each of the sub-tests performed, A has a diagnosis of a deficit in the dimensions of the naming speed function. Especially on the task indicators for naming objects, colors, and letters.

Discussions

This work is one more contribution to the line of research on the clinical utility of the RAN in the context of public mental health. In this case, the aim is to demonstrate that the modified RAN therapy for bilingual children is effective in helping children with dyslexia, especially those who have disorders at the sublexical level.

The result explains the difficulty of A's reading ability is specific to Rapid Automatized Naming (naming objects and letters quickly), which with intensive practice, studies show significant improvement can be seen after age 9 years with specific initial therapy targeting the deficit area, namely Rapid Automatized Naming. The appropriate form of intervention used to train RAN is as follows:

1. Give tasks to the child in the form of Rapid Automatized Naming alphanumeric (Letters)
2. The difficulty level increases gradually. The increased difficulty level is done by increasing the number of letters included in a training session.
3. Subject achievement in each training session was recorded (speed and number error) is recorded.
4. When the child succeeds in breaking the previous time record, the child could be given a reward.
5. Training sessions are held in 5-15 minutes.

An example of RAN training is, as follows:

Given instructions to say the letters: "a b c d e"

If the child has mastered 5 letters, it can be increased at a later stage to 10, then 15 letters until all letters can be mastered quickly and correctly. After mastering all the letters, then you can move to one-syllable words, and so on. The implementation of therapy is limited to a maximum of 30 minutes with a break every 5-15 minutes. One cycle of mastery of letters, for example, requires about 16 weeks, with 2-3 meetings per week. Exercise can be repeated in the next cycle for words, up to sentences. Parents are not expected to expect a hasty result.

Finally, suggestions are proposed to treat someone with dyslexia. A has the modality of

segmenting word sounds into smaller units/aspects and has a normal working memory for storing information in a short time. So that A is expected to be more motivated to continue learning despite discomfort. A is also expected to be able to increase reading activities with the media he likes such as games and flashcard games. A cannot follow the reading learning model as peers. So that parents and teacher A can adapt to try various learning methods with a certain approach to help A in learning to read. Then, Parents and teachers are expected to be able to provide more intensive learning time in terms of quality compared to their peers in class. As for teachers, they need to make approaches and interventions that focus on overcoming the A deficit in naming speed abilities. Later on, Parents can assist more from time to time, avoid labeling, and provide positive stimulation so that children do not easily give up and accept difficulties and are willing to rise to try new challenges, especially in reading and writing. It also needs great collaboration between parents and teachers. Parents and teachers encourage various forms to restore A's confidence in reading and writing along with improvement after intervention and therapy for the management of dyslexia A. They can also make reading activities as interesting as possible by looking for reading content that A is interested in first and using simple words accompanied by pictures. Parents and teachers can also provide role models for people who are successful despite suffering from dyslexia, like Albert Einstein, Orlando Bloom, Jackie Chan, McDreamy, Patrick Dempsey. At home, Parents can provide gadgets by choosing applications or games that are useful to help with dyslexia. A is very used to playing with gadgets, while some software, Dragon Naturally Speaking or Kurzweil 3000 has been proven to help with dyslexia. The most important thing is parents and teachers can use a multi-sensory approach to help A read.

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