Characteristic Features of Reading Difficulties Among Japanese Children

by

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ABSTRACT

Despite a growing concern about students' learning disabilities (LD) in Japan, reading disabilities (RD) as a major type of LD is underestimated by educators and researchers due to the uniqueness of the Japanese writing system. Consequently, formal diagnostic means of RD are missing in Japan, and students with RD are likely left behind without receiving educational support. My study tested and compared Japanese children with and without reading difficulties in three areas: oral reading, writing, and cognitive tasks. The demonstrated typical features of reading difficulties are expected to contribute to the future development of RD definition and diagnostic tools in Japan. This endeavor was accomplished through a qualitative descriptive method with supplementary use of quantitative data. The sample included two groups of elementary school students, each with 7 children, from a city in the southwest of Japan. A set of three tests was administered individually to all participants: the Oral Reading test, the Story Construction test, and the modified Bangor Dyslexia Test. The uniqueness of the Japanese writing system, which is said to hinder the manifestation of RD was removed in the tests as much as possible. I hypothesized that students with reading difficulties (Group A) clearly showed lower levels of performance in three tests than students without reading difficulties (Group B). On the Oral Reading test, Group A students showed more negative attitudes toward reading. Typically, their reading was slow, stumbling, and incorrect in phonological coding and meaningful segmentation. Group B students read more smoothly with the use of prediction skills. In the Story Construction test, Group A writers showed impulsiveness and little planning. Their stories were sloppy, short, and incoherent. Group B writers planned and developed stories with appropriate mechanical skills. In the modified Bangor Dyslexia Test, Group A students made more mistakes and took more time in responding. Typically, they struggled to recall sequential symbols. Also, they displayed features such as weaknesses in phonological skills, sequential processing deficits, and memory deficiencies. These weaknesses are consistent with those reported in current studies on RD in both Japan and North America. The findings of this study, therefore, strongly

indicate RD signs among Japanese children. The results have implications for education and research. Educators should be aware of RD signs in Japanese children and intervene properly. Researchers are expected to establish an RD definition and develop valid assessment tools.

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CHAPTER I

INTRODUCTION

Background

"For many years, to be disabled in Japan meant to be forgotten" (Mogi, 1992, p. 440). Takano and Watanabe (2001) attribute this tendency to the Japanese society and schools' being less tolerant of any kind of difference; for example, students' inabilities in academic achievement are likely to be considered the result of their lack of effort and delinquency. Only in the 1990's did the Japanese government initiate research into learning disabilities (LD) (Tsuge, 2002). In 1999 the Japanese Ministry of Education[1] established the definition of LD and decided to conduct a nationwide school-based survey to determine LD distribution for the purpose of further educational planning (Yomiuri Shinbun, 2000). However, it remains questionable if children's learning difficulties are properly understood by teachers, especially reading disabilities (RD).

Approximately 80% of children with LD have RD (Lerner, 2000). According to multilinguistical brain research, RD is considered to occur regardless of orthography (Paulesu, Démonet, Fazio, McCrory, Chanoine, Brunswick et al., 2001). The impact of RD is profound. Reading is the fundamental learning tool for all academic subjects, and RD can develop into problems beyond literacy. Number, direction, and order are included (Miles, 1993). However, the presence of RD has been underestimated in Japan. For example, Gakken (1997) boasts that Japan's literacy rate is 100%, and Makita (1968) estimates the rate of RD in Japan to be less than 1%, if any. Hence, research on this issue in Japan has been insufficient and thus, diagnostic procedure is missing.

Purpose of the Study

The main purpose of this study was to examine the characteristic features of reading difficulty among Japanese children, not to screen out and label children with RD. The features might be interchanged with RD indicators and contribute to the accumulation of data in Japan. Consequently, it is hoped that educators will be aware of RD signs that children show, and understand better children's conditions and intervene properly. Although RD is not curable, studying its early manifestation is important for predicting and circumventing children's further learning difficulties (Dyslexia Clinic, Faculty of Integrated Arts and Sciences, Hiroshima University, Japan [Dyslexia Clinic], 1995; Koeda, 1999; Lerner, 2000; McCardle, Scarborough, & Catts, 2001; Miles, 1993; Tsuge, 2002; Sakai, 1999). A specific focus of this study was students at the elementary level. This is because that the elementary school is the earliest official learning environment in Japan without the preschool system.

Research Questions

The major research question asked in this study is "what are the characteristic features of reading difficulty among Japanese children?" Here, "reading difficulty" is interchangeable with "suspected RD." In order to examine the nature of reading difficulties in the Japanese language more thoroughly, this study explored the areas of reading, writing, and other cognitive issues of elementary school students in Japan. Comparison was made between students with and without reading difficulties.

Specific research questions are as follows: (a) What are the differences between students with and without reading difficulties in reading? (b) What are the differences between students with and without reading difficulties in writing? (c) What are the

differences between students with and without reading difficulties in specific cognitive areas?

Definitions of Terms

The following definitions apply to the terminology used in the study. It is important to note that dyslexia or reading disabilities is defined as a major type of LD.

Learning disabilities (LD): in North America, the most commonly used definition is specified by the IDEA (Individuals with Disabilities Education Act), enacted in 1997 as follows:

> The term, "specific learning disability," means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include a learning problem which is primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (as cited in Lerner, 2000, p.9).

In Japan, the Japanese Ministry of Education defines LD as follows:

> Learning Disabilities refers to varied conditions, fundamentally without mental retardation, manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, calculation, or reasoning.
>
> Learning Disabilities is presumed to be due to central nervous system dysfunction as a cause, although visual impairments, hearing impairments,

reading at the Japanese elementary level were examined. Second, a term *reading difficulty* (or *difficulties*) was considered appropriate and used to refer to the participants of this study. RD definition and diagnostic procedure is missing in Japan; therefore, it was considered dangerous to identify the participants as having *reading disabilities*. Therefore, common difficulties in reading without a formal diagnosis were defined *reading difficulties* in this study. Third, in consideration of the time frame allowed for this research and the need to reduce the participants' fatigue, the test items were kept to a minimum. However, this third limitation was balanced by administering a set of three instruments in order to enhance the validity of the assessment of individuals' reading abilities.

Chapter Summary

LD recently has been brought into educational discussion at the government level in Japan. However, RD as one of the major characteristics of LD is barely studied in Japan regarding its incidence and characteristics. Many children with RD are likely to be neglected or overlooked greatly, thus deprived of learning opportunities. Meanwhile, their loss of self-esteem and self-confidence cause concern.

In this study, characteristic features of reading difficulty among Japanese children are examined through comparisons between children with and without reading difficulty. The study will add to relevant data in the Japanese special education field. Features of reading difficulty examined in the present study may be considered as Japanese RD characteristics, and will serve to facilitate development of RD definition and diagnostic tools. Importantly, the results can increase the awareness of educators and help them plan necessary educational services.

intellectually handicapped, emotional disturbance, or with environmental influences are not the direct cause (English translation by LD Station, n.d., p. 2).

Reading disability (dyslexia) : "The term reading disability (RD) is often used interchangeably with dyslexia" (Shaywitz et al., 1992, p. 146). For the purpose of consistency, RD is mainly used in this study. The World Federation of Neurology (1970) defines specific developmental dyslexia as follows:

> A disorder manifested by difficulty in learning to read despite adequate conventional instruction, intelligence, and sociocultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional origin (as cited in Taylor & Taylor, 1983, p. 399).

Orthography: "the rules or conventions for using letters to spell words" (Taylor & Taylor, 1983, p. 94). *Shallow orthography* has concrete letter–sound correspondence; *deep orthography* has ambiguous and complex letter–sound correspondence (Paulesu et. al, 2001).

Kanji writing system: nonphonetic and meaningful logography originating in Chinese (Taylor & Taylor, 1983). Kanji represents morphemes (i.e., a unit of language that carries a meaning and consists of a few alphabet letters or one kanji) of Japanese (Sasanuma, 1980).

Kana writing system: phonetic symbol consists of two syllabaries: *hiragana* (cursive, used to write grammatical particles and certain native words) and *katakana* (plain, used to write foreign words and some onomatopoeic words) (Taylor, 1981).

Delimitations of the Study

The study was limited in three regards. First, only readers who had difficulty with

CHAPTER II

LITERATURE REVIEW

This chapter reviews current literature on LD and RD. RD accounts for one of the conditions of LD, and RD and LD are often considered in the same category (See p.3 above for definition of LD by IDEA). LD and RD have not yet been studied sufficiently in Japan. Therefore, relevant information mostly based in the North American context will be presented for the purpose of reference and comparison. (The Japanese literature is translated into English by the researcher who is a native speaker of Japanese.) First, neurological views of LD and RD will be presented. Second, issues concerning LD will be discussed briefly, since RD accounts for one of the major characteristics of LD, as mentioned in Chapter I. Third, RD will be examined with regard to its nature and current educational practices, including assessment procedures. Fourth, the Japanese writing system will be described to explain the linguistic context of RD. Finally, current studies and cases of RD among Japanese students will be explored.

Neurological Views of Reading Disabilities (RD) and Learning Disabilities (LD)

The occurrence of RD and LD is commonly attributed to brain dysfunction and structure. According to Lerner (2000), Orton in 1937 introduced the concept *strephosymbolia* (reversal of letters and words) due to insufficient cerebral dominance or control of language in left brain hemisphere. Considerable neurological research on RD (LD) has followed since Orton's discovery. In particular, magnetic resonance imaging (MRI) research shows that the frontal region of the brains of children with LD and dyslexia is symmetrical and smaller than that of normal children (Lerner, 2000; Miles, 1993). Furthermore, functional magnetic resonance imaging (fMRI) research by

Shaywitz et al. (1998) reveals that the underactivation in posterior regions including the Wernicke's area, the angular gyrus, and striate cortex as opposed to the relative overactivation in anterior regions is strongly related to RD occurrence. And, according to the brain electrical activity mapping (BEAM), a dyslexic's electrical brain waves corresponding to sounds, sights, and words differ from a non-dyslexic's in the left brain hemisphere, the medial frontal lobe, and the occipital lobe (Lerner, 2000).

Postmortem anatomical studies have yielded results similar to these of the new imaging technology research. The planum temporale in the Wernicke's area located in both the left and right hemisphere is symmetrical in a dyslexic's brain, unlike a non-dyslexic's (Lerner, 2000; Taylor & Taylor, 1983). Other postmortem anatomical studies revealed that dyslexia is closely tied to the magnocellular system (the visual system that corresponds to fast lower-contrast information) (Miles, 1993).

Thus, there are many neurological explanations for RD and LD occurrence, and "detailed explanations of how or why dyslexics' brains are different from those of normal readers" (Helmuth, 2001, p. 2065) remain to be clarified. Generally, RD and LD occurrence is most likely to be explained by subtle abnormality in the left hemisphere of the brain. Such structural and functional differences in the brain are considered to cause both letter-sound processing problems (Newsweek, 1998) and also the imbalance of skills and slow processing of symbolic materials and their verbal labeling (Miles, 1993).

Family inheritance (genes and chromosomes) of RD and LD plays an important role in neurological problems as well (Kaplan, Gáyan, Ahn, Won, Pauls, Olson et al., 2002; Miles, 1993; Sakai, 1999; Taylor & Taylor, 1983). For example, twins show similar dyslexic characteristics even when they are brought up separately (Lerner, 2000).

Thus, it has become more evident that dyslexia is associated with an individual's intrinsic factors.

Admittedly, cultural factors have an influence, but the neurological factors are basic. Significantly, Paulesu et al. (2001) compared the brain function in the oral and sound reading of adult readers using positron emission tomography (PET) to investigate that certain language exposes RD while others compensate RD. Different orthographies (English and French versus Italian) were compared. The number of people with dyslexia are said to be about twice as many in the U.S.A. as in Italy (Helmuth, 2001). However, PET and fMRI scans showed that *all* dyslexics had reduced activity in their brain areas that respond to printed material, independent of orthography.

Learning Disabilities (LD)

The term LD was first suggested by Samual Kirk at the Conference on Exploration into Problems of the Perceptually Handicapped Child in 1963, and was approved as a reference to children who showed developmental disorders in learning and communication skills without visual and auditory impairments and mental retardation (Lerner, 2000; Torgesen, 1991). In the co-existence of several definitions of LD today, Lerner (2000) finds the common elements as follows: (1) central nervous system dysfunction, (2) uneven growth pattern and psychological processing deficits, (3) difficulty in academic and learning tasks (i.e., reading, writing, listening, speaking, calculation, and mathematical reasoning), (4) discrepancy between achievement and potential, and (5) exclusion of other causes, such as mental retardation, visual or hearing impairment, or socio-cultural or economic environments. As opposed to the fifth element; however, conditions such as social disadvantage and low motivation often

account for LD in practice (Snow, Burns, & Griffin, n.d.; Taylor, 1981). Based on the LD definition(s), the percentage of students with LD in the U.S. school population is 5.5% as of 1997 (Lerner, 2000).

Here, the conventional educational identification of LD is wider than just a medical category. Although LD definitions exclude general poor achievers, the educational identification of LD does not necessarily differentiate children with LD from other poor achievers (Tsuge, 2002). Torgesen (1991) refers to two major groups of researchers. One group supports cognitive and neuropsychological discrimination between LD children and other poor learners (e.g., Rutter & Yule, 1975). The other group argues that appreciable discrepancy is hardly noticed between LD children and other poor learners (e.g., Fredman & Stevenson, 1988; Siegel, 1989; Taylor et al., 1979). In general, "overutilization of the LD label" (Torgesen, p. 31) has likely taken place. However, to broaden the LD definition or not remains a dilemma. Considering public money expenditure on the increasing number of children diagnosed with LD, stringent criteria that differentiate between LD and other children may be important (Lerner, 2000). In contrast, exclusive categorization will deprive other poor achievers of their opportunities of special education service (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Shaywitz et al., 1992).

Learning Disabilities (LD) in Japan

Unlike North America, only one official committee in Japan makes educational decisions concerning LD. Commissioned by the Japanese Ministry of Education, the Research Committee on Learning Disabilities and Other Learning Difficulties was first convened in June 1992. In 1995, the committee declared the first definition of LD that

suggested the broad range and ambiguous nature of LD, indicating that LD occurrence could be associated with environmental and social problems (Ozaki, Kusano, Nakayama, & Ikeda, 2000). In 1999, the revised and final version of LD definition was declared (see Chapter I). Compared to the former definition, the latter emphasizes the exclusiveness of LD and specifies the types of academic tasks affected by LD. The criterion for LD identification is having specific difficulties in learning despite adequate intelligence (Tsuge, 2002). Unfortunately, the current incidence and distribution of LD are not provided in the literature.

The Japanese Ministry of Health and Welfare[2] initiated a survey on LD in 1992 from a medical perspective. This survey applied LD assessment criteria to central nerve system dysfunctions and, therefore, claimed the necessity of multiple tests to detect LD accurately and strictly (Koeda, 1999). Here, disagreement between educational and medical services occurs; the former has a broader LD definition, the latter a narrower one. In practice, pediatricians predominantly assess children; a few educational services (school districts) conduct their own assessment procedures with clinical psychologists and speech therapists (Takano & Watanabe, 2000).

Currently, the survey on LD in Japan does not seem to support children with LD sufficiently. Children with LD are not eligible for special education in Japan (Takano & Watanabe, 2001). Resource room service has been established in public elementary schools since 1993, but only for children with speech disorders, emotional dysfunctions, and visual and hearing impairments. Therefore, children with LD are usually placed in regular classrooms. Mogi (1992) is concerned that the present 1:40 ratio of teachers to students in a regular class hinders teachers from paying much attention to the special

needs of children with LD. Children with LD have problems are expected to adapt to the regular classroom without additional help.

Reading Disabilities (RD)

Around the beginning of the nineteenth century, researchers began to report cases of specific reading disabilities, and called the symptoms *word blindness* (Miles, 1993). Word blindness was said to occur regardless of one's average intelligence level, but to result from one's injured brain part that restored visual memory for words and letters (Torgesen, 1991). Successively, an American neurologist, Samuel Orton, reported that delay or failure in establishing dominance for language in one's left hemisphere results in mirror images of letters (e.g., b–d, p–q) (Lerner, 2000). Likewise, Miles (1993) defines the concept of dyslexia as "constitutionally caused limitation" (p. 177) that typically manifests itself in the pattern of difficulties and requires specialized learning proceedings. Therefore, we must not take for granted that a child with RD can acquire knowledge, as other children can, through ordinary experience at home and school (Dyslexia Clinic, 1995; Horie, 1987). Typically, people with RD have difficulties with phonological processing including phonological and/or articulatory awareness (Griffiths & Frith, 2002; Montgomery, 1981). In addition to literacy problems, parts of the "overall dyslexic picture" (Miles, 1993, p. 15) can include confusion between left–right, east–west, b–d; confusion over times and dates; difficulty recalling months of the year and strings of digits.

RD itself has no cure and persists into an individual's adulthood (Francis et al., 1996; Griffiths & Frith, 2002; Taylor & Taylor, 1983). Nonetheless, suitable practices, trainings, and exposure (to appropriate stimulus) allow children with RD to achieve

compensational strategies to improve their reading and other learning skills greatly (Yamada & Banks, 1994). Given that a child has an average intelligence level, which is a criterion of RD assessment, reading improvement highly depends on instructional methods. For example, Yamada (2001) argues the importance of the context-dependency effect (i.e., people can more easily process information in a familiar context than an unfamiliar context) in reading instruction referring to Steinberg's Universal Four-Phase Reading Program which comprises the word familiarization, word identification, phrase and sentence identification, and book reading phases. Teachers' and parents' setting up such phases in meaningful, interesting, and exciting environments improves a child's reading abilities greatly.

Assessment of Reading Disabilities (RD)

The primary goal of assessment should be detecting an individual child's needs, because RD differs from one child to another in its type, degree of severity, age level, and population. Consequently, assessment should lead to individualized educational planning. Miles (1993) emphasizes that the purpose of assessing dyslexia is to (a) fully understand the child's intrinsic limitations, (b) give the child and family an accurate account of her or his strengths and weaknesses, and ultimately (c) improve her or his self-esteem and self-confidence. Children with RD have many strengths, as well as weaknesses in literacy. Significantly, assessment should be used in order to draw out their strengths, instead of focusing on weaknesses.

Practice in North America

RD prevalence rate in North America is 5-15%. The range is perhaps due to

North America's heterogeneous population, its variety of socioeconomic status, and its lack of a uniform definition (Taylor & Taylor, 1983). The prevailing criterion for RD identification is a discrepancy between IQ tests scores and achievement tests scores, since having adequate intelligence (the IQ score of 90) is one of the conditions for the identification of a child's RD (Tsuge, 2002). Today, scores obtained from IQ tests are considered as a "benchmark (of) 'expectedness' or aptitude for learning" (O'Malley, Francis, Foorman, Fletcher, & Swank, 2002, p. 32). Achievement tests refer to reading tests that include orthographic coding, phonological awareness, and word recognition measurements (Kaplan et al., 2002). If a child's reading test scores are lower than predicted scores based on IQ tests, he or she is defined as having RD and is eligible for special education. A common criterion for IQ discrepancy is two grade levels of retardation with average or near-average IQ scores (Stevenson et al., 1982). However, taking into account that the IQ tests are more likely to measure an individual's prior academic achievement than her or his potential ability to learn, IQ tests may underestimate an individual's general intelligence if she or he has RD (O'Malley et al., 2002). This is because word acquisition for children with RD is typically about 10 months later than for children without RD (Miles, 1993).

Likewise, Snow et al. (n.d.) point to the arbitrariness of deciding the point at which RD is distinguished from normal reading. In the U.S.A., the degree of discrepancy and the criteria vary from state to state (Lerner, 2000). Accordingly, anomalies exist in practice; for example, a student identified as having RD in State A might not be qualified for special education in State B, and vice versa. Miles (1993) refers to the difficulty in accurate identification of RD for the following reasons: (1) there is no single criterion

sufficient for RD identification, (2) sometimes the history of early difficulty can be more relevant for diagnosis than the scores at the time of testing, (3) a valid measurement of intelligence level of subjects is absent, and (4) subtle RD signs that are expressed in a child's remarks or behavior may not be detected by an assessor. It is, therefore, suggested that instead of setting a cutoff point for the purpose of educational decision, educational support should be provided with children at any level of reading difficulty (O'Malley et al., 2002; Shaywitz et al., 1992; Snow et al., n.d.).

With growing consensus, earlier identification and intervention of RD prior to the manifestation of problems have become an educational goal in the West (Francis et al., 1996; Lerner, 2000; McCardle et al., 2001; Miles, 1993; O'Malley et al., 2002; Taylor & Taylor, 1983). The reason for this movement is to prevent the persistence of poor reading and avoid secondary reading problems such as overall academic failure and lowered self-esteem. Francis et al. (1996) argue that both low-achieving and IQ-discrepant poor readers have a deficit (not a mere maturational lag) in brain organization and have no possibility of catching up to non-impaired peers without intervention.

Practice in Japan

There is a disagreement concerning the incidence rate of developmental RD in Japan. Some have claimed that RD is rare in Japan compared to English-speaking countries (Liberman et al., 1974; Makita, 1968; Taylor, 1981; Taylor & Taylor, 1983). Others have argued that RD exists, but it goes unnoticed (Hirose & Hatta, 1988; Japanese Academy of Learning Disabilities [JALD], 1997; Stevenson et al., 1982; Uno, n.d.; Yamada & Banks, 1994). Makita (1968) reports that the early stage of orthographic confusion in Japanese children does not develop into RD at a clinical level. However, if

children have brain deficits that they cannot outgrow, their difficulties must persist into higher grades. On the contrary, Paulesu et al. (2001) conclude that "a phonological processing deficit is a universal problem in dyslexia and causes literacy problems in both shallow and deep orthographies" (p. 2167) but manifestation of RD is less severe and tends to be hidden in a shallow orthography. This conclusion finds support with other studies (e.g., Helmuth, 2001; Stevenson et al., 1982; Yamada & Banks, 1994).

The role of standard learning discipline is disputed. Makita (1968) also claims that Japanese respect for education and authority leads to disciplined teaching in the classroom, and therefore, developmental dyslexia is unlikely to exist. In contrast, Stevenson et al. (1982) report that 8% of Japanese 5th graders (against 3% of American cohorts) are more than two-grades behind in their reading level. In response, Taylor and Taylor (1983) argue that those 8% poor achievers were merely overloaded with the heavy curriculum requirements of the elementary school year.

Currently, the belief that RD is quite rare among Japanese people (e.g., Makita, 1968) is predominant. Due to the consequent lack of research, Japanese terms considered equivalent to RD are not consistent. The most common word, *nandoku-shoo*, in which *shoo* literally means unusual symptoms of a disease (*nandoku* means difficulties reading), sounds severe to a diagnosed child and parents. *Dokuji-shoogai*, in which *shoogai* means disabled or disordered sounds discouraging as well (*dokuji* means reading letters). *Shitsudoku-shoo* (meaning unusual symptoms due to the loss of reading abilities) sounds even more shocking. In fact, no Japanese word equivalent to RD in the Western sense is said to exist (Stevenson et al., 1982; Taylor & Taylor, 1983; Yamada & Banks, 1994). Both Dyslexia Clinic (1995) and Uno (n.d.) in National Institute of

Mental Health National Center of Neurology and Psychiatry emphasize that dyslexia translated into Japanese should not imply *symptoms of a disease.* Rather, it should refer to the *condition* when one cannot read or write sufficiently despite average or near-average intelligence. Most suitably, RD is *dokuji-konnan* (*konnan* means difficulty; no implication of possessing a disease or disabilities) (Dyslexia Clinic; Uno) and as a *difficulty,* it is worthy of research.

A further problem is that established formal assessment procedure for RD in Japan is not found in current literature. It is assumed that LD assessment procedures apply to RD as well. With respect to LD assessment, Wechsler Intelligence Scale for Children (WISC-R) is the most commonly used IQ test to measure the discrepancy between a child's potential intelligence level and academic performance level (Takano & Watanabe, 2001). However, Dyslexia Clinic (1995) considers that some subtests in WISC-R do not genuinely measure a child's intelligence level if he or she has RD. For example, questions such as "matching" and "maze" within a timeframe seem to measure an individual's promptness in response rather than intelligence level. Considering that children with RD have difficulty in rapid verbal labeling and word retrieving (Miles, 1993), re-thinking of assessment procedures will be needed.

In order to establish reliable assessment procedures for detecting RD, Dyslexia Clinic (1995) claims that systematic recording of indicators is important. These indicators include (a) stumbling in oral reading, (b) problems in writing, (c) weaknesses in number manipulation, and (d) others (bisymmetry confusion, clumsiness in motor skills, and weaknesses in speech). In addition, resulting from a statistical research study of 200 children who have problems in reading and their parents, the following tendencies

of Japanese dyslexia are reported: (a) left-handedness, (b) having allergies, (c) clumsiness at sports, and/or (d) extreme obesity or leanness. Mothers tend to have (a) been distressed during their pregnancy, (b) experienced a hard labor, (c) experienced miscarriage(s), and (d) taken a uterine contraction accelerator at their delivery (Dyslexia Clinic, 1995).

Such varied factors require increased medical and educational awareness of RD. In the medical field, insufficient accumulation of cases occasionally leads to wrong diagnoses or failure to identify RD characteristics (Koeda et al., 1986). In the educational field, "few Japanese educators and school teachers are even aware of the concept of dyslexia" (Yamada & Banks, 1994, p. 105). JALD (1997) encourages all teachers, parents, and doctors to be sensitive to children's signs of RD in order to diagnose objectively and to intervene properly. In practice, teachers have many opportunities to observe a child's academic performance and behavior; therefore, their awareness or ignorance of indicators of RD can have a crucial affect on a child's life. Tsuge (2002) emphasizes that RD or LD certainly exists, but societal lack of awareness and consequent lack of assessment tools have hidden the presence of RD (LD) for a long time. The purpose of assessment (i.e., educational planning and support provision) therefore, must be clarified to avoid stigmatizing a child.

The Japanese Writing System

Before referring to the Japanese orthographic system as a whole, the kanji and kana writing systems as crucial components should be introduced respectively for better understanding of the Japanese writing system.

The Kana System (Hiragana and Katakana)

Each kana script represents a speech sound: a syllable, or more precisely, a mora. A mora refers to "a short sound uttered in the same length of time as an ordinary short syllable" (Taylor & Taylor, 1983, p. 60). Both hiragana and katakana (See p.5 above for definition of the hiragana and katakana syllabaries) are equivalent to one another, but the shapes are different. Each kana script has a concrete one-to-one correspondence between a script and a sound, ending with a sound of a vowel (except ん /n/). The exceptions are は /ha/ and へ /he/. When they are used as postpositional particles, they are sounded as /wa/ and /e/ respectively. There are basic 46 scripts in the kana syllabary, with specific order (i.e, syllabary strings) to memorize (e.g., *a i u e o, ka ki ku ke ko, sa si su se so*, etc.) Application of diacritic marks to some kana scripts creates another 25 syllables, for example, a hiragana は /ha/ will be elaborated into ば /ba/ and ぱ /pa/. In its katakana equivalence, ハ /ha/ will be elaborated into バ, and パ. (Notice the shape differences.) Certain combinations of kana scripts make some special phonetic sounds. These include (a) an /n/ sound preceded by a syllable (e.g., /han/), (b) a long vowel (e.g., /okaasan/), (c) a silent mora between a shortly uttered vowel sound and a consonant (e.g., /ka (a pause) ta/), (d) a contracted sound (e.g., /kya/, /sha/, and /cho/), and (e) a long contracted sound (e.g., /kyoo/, /chuu/, and /chii/), to create 273 speech sounds using basic 23 phonemes (Hotta, 1984). Such combinations of kana scripts are not sounded as they are read, and thus, special phonetic sounds break the Japanese basic rule of one-to-one correspondence between a script and a sound. In written text, hiragana scripts are often combined with kanji characters to complete words. Usually Japanese children have already acquired some kana reading and writing skills

before they enter school. Therefore, most of the time in school teaching is devoted to the kanji system and not the kana system.

The Kanji System

The Japanese Ministry of Education requires students to handle at least 1,850 kanji characters by the end of high school. During elementary school years, approximately 1,000 kanji characters are taught for children to remember. The individual meaningfulness of kanji characters decrease as bound morpheme kanji characters are introduced after grade 2, and students learn to compound kanji characters to make words (Yamada & Banks, 1994). Taylor and Taylor (1983) state that the kanji system is quite chaotic compared to the simplicity of the kana system. For example, each kanji character usually has two kinds of reading: *kun*-reading and *on*-reading. In general, a *kun*-reading of a kanji character sounds the original meaning of the kanji; an *on*-reading does not make much sense when individually sounded, but does when used as a component of words. When kanji characters 白 (white) and 鳥 (bird) (sounded /shiro/ and /tori/ by *kun*-reading respectively) are combined to create a word 白鳥 (swan), an *on*-reading of each kanji character is applied to sound the whole word (/haku-choo/). Each kanji character has one or more *on*- and *kun*-readings respectively. For instance, 正 (correct) has no fewer than 2 *on*-readings and 14 *kun*-readings with little similarity in pronunciation. In a Japanese text, *on*-reading is used 4.6 times more frequently than *kun*-reading (Yamada, 1992). Unlike Taylor and Taylor (1983) who find this dual reading system of kanji characters chaotic, Suzuki (1996) speaks highly of this system for its applicability. That is, knowledge of *on*- and *kun*-reading of basic 2,000 kanji

characters (taught by the end of high school education) enables an individual to read, understand, and create thousands of words freely.

An abundance of homophonous kanji characters is another feature of the kanji system. For example, a sound /ko/ can be written in different kanji characters 子, 個, 小, 炬, 故, 弧, 粉, 児, 湖, etc. (Each kanji character has a different meaning.) Unlike English that has 45 phonemes, Japanese has only 23 phonemes. The abundance of homophonous kanji characters compensates for the restricted number of speech sounds in Japanese (Suzuki, 1996). For example, a speech sound /hana/ refers to both "nose" and "flower" but is written 鼻 and 花, respectively, to address the different meanings. Therefore, to visualize an image of a given homophone in a conversational situation becomes important. Selecting appropriate kanji character in speaking and writing Japanese is essential for correct understanding of context. Here, an individual's knowledge of the dual reading system (i.e., *on*- and *kun*-reading) helps this task. Thus, using kanji characters depends highly on both visual and auditory proficiency. Therefore, Suzuki (1996) calls the Japanese language: "TV type language" (p. 195) in contrast to English as "radio type language" (p. 195).

Another characteristic of the kanji system is graphic similarity. Since there is no analytic correspondence between grapheme and sound in the kanji system, mnemonic strategies of grapheme–meaning correspondence are important in kanji learning. Due to the increasing number and complexity of kanji characters taught at school, even normal students have difficulty handling all kanji characters (e.g., 60–70% of Japanese 6th graders can read and write kanji at grade 3 level) (Yamada, 1992). Here, students' memory of previous reading and hearing (in speech) and efficient information retrieval

affect their guessing at the most suitable reading of kanji character (Stevenson et al., 1982). Fortunately, many kanji characters have certain structural regularities in the way components (strokes) are combined. For example, 地 (ground) and 池 (pond) are distinguished by their radicals at the left: 土 radical is related to soil; 氵 radical is related to water. In fact, a standard kanji dictionary arranges kanji characters in terms of their radicals (Sasanuma, 1980). Thus, to read and write kanji characters successfully, one must recognize the correspondence of shape and meaning of kanji characters (Hirayama, Eda, & Nishikawa, 2000).

Thus, kanji learning might sound more difficult than kana learning. However, kanji learning is considered easier than that of meaningless kana. An experiment on Japanese aphasics (i.e., people who have speech impairment caused by their left brain hemisphere damage) by Sasanuma and Fujimura (as cited in Taylor & Taylor, 1983) revealed that kanji words were easier to identify as meaningful units than kana words. The same finding was obtained by Steinberg and Yamada (1978–79) from their experiment on 42 normal Japanese children of 3 and 4 years of age. The researchers presume that the kanji system, which is associated with meaning, makes Japanese RD occurrence difficult to detect (see also Taylor & Taylor, 1983; Yamada & Banks, 1994).

Mixture of Different Writing Systems

Japanese texts incorporate many systems. Typically, Japanese texts consist of 25–35% of kanji, 65% of hiragana, 4% of katakana (it depends on the content of the text), and the rest for Roman alphabets and Arabic numerals (Taylor, 1981). Here, 22 of the 26 Roman alphabets are applied to express Japanese speech sounds, and the system is

called the romaji system. For example, an English word *cat* is expressed *kyatto* in romaji. Also, the Japanese writing has adopted some Western punctuation marks and can be written either vertically (right to left, top to bottom) or horizontally (left to right). Apparently such a mixture of different writing systems plays havoc with reading; although, the differently shaped design of each script performs the function of visually separating words in highly dense Japanese texts, which usually do not have marked word boundaries like spaces in English (Taylor, 1981; Steinberg & Yamada, 1978-79; Yamada & Banks, 1994).

The following Japanese sentence from a cookbook, which includes different writing systems, illustrates the value of mixed scripts: "鶏肉とベーコンは1.5cmの角に切る" ("Cut the chicken and the bacon in 1.5 centimeter cubes.") (as cited in Taylor, 1981, p. 25). 鶏肉, 角, and 切 are kanji; ベーコン are katakana. The rest are all hiragana excluding *1.5 cm*. If the same sentence is written in hiragana only, it comes out as follows: とりにくとべーこんはいってんごせんちのかくにきる. The visual difference makes a sentence of mixed scripts far more advantageous for Japanese readers since the different types of scripts function as visual boundaries (Yamada & Banks, 1994). Thus, Japanese can be referred to as a "TV type language" (Suzuki, 1996, p. 195). Especially, the meaningfulness of kanji standing out as "bold figures against the background of kana symbols" (Sasanuma, 1980, p. 49) compensates poor reading skills.

Reading Disabilities Among Japanese Children

Current Studies

Several studies have reported Japanese students with RD. In an experiment

conducted by Yamada and Banks (1994), eight students out of a hundred and twenty five 4th graders in a Japanese public elementary school were identified as having RD. In the oral reading test, these eight students showed not only slow reading rates, but also mid-word pauses, incorrect intonations, and transitional errors indicating their having decoding and sequential processing deficits. They scored significantly lower than other students in the test to detect RD. As a result of a study of a hundred and eight 8th graders in a Japanese junior high school, 5% of the students were diagnosed as having RD (Dyslexia Clinic, 1995). Coincidentally, these diagnosed students showed slow reading rates both in English and Japanese. This result proves the existence of RD among Japanese students regardless of orthography.

Likewise, Stevenson et al. (1982) refute a common hypothesis that the incidence of RD in Asian languages is much lower than in Western languages owing to orthographic factors. Results from three kinds of reading tests (sight vocabulary, reading of meaningful texts, and reading comprehension) for 5th graders in the U.S., Taiwan, and Japan found no greater incidence of RD in American children. In fact, Japanese children failed to meet the grade standard at the highest percentage (8%), showing weaknesses in both vocabulary and comprehension. Also, results from a Japanese achievement test on 5,000 elementary children conducted in 1992, 8.8% of the children were found to have more than 2-grade level retardation at their graduation (Hirayama et al., 2000; Tsuge, 2002). Thus, it will be appropriate to conclude that RD is by no means rare in Japan; although, only its manifestation is not as evident as in English speaking countries.

Conditions and Cases

It follows that comprehensive study of RD is important. Individuals who cannot read sufficiently cannot write sufficiently either (Dyslexia Clinic, 1995; Oota et al., 2001; Uno, n.d.). The followings are examples of RD (LD) expressed first in Japanese students' reading, then in their writing.

A basic difficulty with respect to reading seems to be remembering script-sound correspondence in the kana system. Usually, Japanese children are taught kana as follows: い/i/ for いぬ/inu/ (dog); however, children with RD often have difficulty retaining such information (Oota et al., 2001; Uno, n.d.). Recognition of special phonetic sounds that requires phonological processing is reported to be more difficult for children with RD (Hirayama et al., 2000; Ishibe & Yanagimoto, 2002). Ueno and Muta (1992) explain that such phonological deficits are due to the impaired connection between visual and auditory information. Therefore, children with RD tend to read stammeringly, script-by-script when it comes to oral reading (JALD, 1997; Ozaki et al., 2000; Wodrich & Kush, 1990). Lack of both fluency and speed greatly hinders children's reading comprehension (Allington, 1984; Yamada & Banks, 1994).

Moreover, visual perception deficits seem to cause visual errors between similarly shaped scripts such as は-ほ, め-ね-ぬ, わ-れ, and 粉-紛 (Sakai City Educational Board, 2002; Ueno & Muta, 1992). Script rotation (usually 90° or 180°) such as し→つ and し→へ happens frequently as well (Ozaki et al., 2000; Uno, n.d.). For example, when a child looks at a word いぬ (dog), い might rotate 90° and look like こ, and ぬ might look like め. Then, the mistaken word こめ conveys a different

sound and means rice. Also, kana script order in a word is often interchangeable for children with RD (e.g., ゆかた→ゆたか) (Ishibe & Yanagimoto, 2002). Visual perception deficits also cause children's confusion when they look at a text (Oota et al., 2001; Ozaki et al, 2000). Because scripts in the text stand out all at once (within an individual's perception), children with RD cannot visually distinguish a word (or a sentence) from others. Consequently they read the same part or jump randomly.

Additional difficulties for children with RD are memory retention and retrieval, and syntactic and semantic understanding. For example, visual and/or auditory memory deficits frequently cause poor vocabulary retention and confusion between *on*- and *kun*- reading of kanji characters (Dyslexia Clinic, 1995; Hirayama et al., 2000; Ishibe & Yanagimoto, 2002). Many children with RD are confused with the functions and connections of pronouns and verbs, and the use of postpositional particles (Oota et al, 2001). Postpositions in Japanese are one of syntactic morphemes and come after nouns to indicate their grammatical functions in sentences (Taylor & Taylor, 1983). Those children with RD are prone to make derivational errors (i.e., misreading for a related word) at sentence ending, which is typically a verb or an adjective as a predicative (Ishibe & Yanagimoto, 2002; JALD, 1997; Ozaki et al., 2000). For example, the children might change a sentence ending しました(did) into します(do). Apparently, "processing for meaning" (Miles, 1993, p. 61) is taxing for children with RD; consequently, they often fail to understand the content of a text.

As stated in the previous section regarding brain studies of RD occurrence, a left hemisphere deficit is likely to have a strong relationship with RD. According to Taylor and Taylor (1983), a single kanji is processed in one's right hemisphere as a visual

pattern; multi-kanji words and kana are processed in one's left hemisphere as sequential linguistic material. If that is the case (i.e., left-hemisphere deficit as an explanation for RD), those with RD in the Japanese language must have difficulties in sequential processing rather than individual letter recognition as would be so in English.

In addition to problems in reading, RD tends to cause children's writing problems in many ways. Many children seem to have visual-motor skills deficits that hinder their abilities to write smooth and cursive kana scripts in the same size in a straight line. Their overall handwriting tends to be shaky, sloppy, dense, or dispersed (Hirayama et al., 2000; Ishibe & Yanagimoto, 2002; Oota et al., 2001; Ozaki et al, 2000; Uno, n.d.). Some children have visual perception deficits and/or visual memory deficits. They often miswrite similar scripts, present mirror-image writing, omit script(s), misarrange kanji-component, replace kanji-word order (e.g., 学校→校学), fail to remember correct writing order and number of strokes in kanji characters, and confuse between homophonous kanji characters (Ishibe & Yanagimoto, 2002; Hirayama et al., 2000; Oota et al., 2001; Ueno & Muta, 1992).

As with reading, phonological processing deficits affect RD children's writing. Typically, special phonetic sounds (moras) seem to be extremely difficult for them (Oota et al., 2001). For example, they write パイッナプル for パイナップル (pineapple); きべつ for きゃべつ (cabbage); きゅうしつ for きょうしつ (classroom). Here, auditory perception deficits should be taken into account, because when a child cannot distinguish a sound properly, she or he cannot write it down correctly (Oota et al., 2001). For example, らくだ (camel) /rakuda/ might be heard and written だくだ/dakuda/ by children with RD.

Thus, children with RD seem to have a complex combination of perceptual, motor, and cognitive problems that make it difficult for them to convey meaning in both reading and writing. Naturally, they are prone to make semantic errors. According to Coltheart (1980), there are two major categories in semantic errors (SEs). One is associative SE, which occurs due to an associative link between stimulus and response (often stimulus and response are syntactically and semantically different) (e.g., knife→ fork); the other is shared-featured SE, which occurs due to a sharing of basic semantic features between stimulus and response. Shared-featured SE is divided into two groups. One is superordinate SE (semantic feature of stimulus would be included in that of response) (e.g., bush→tree); the other is co-ordinate SE (often a synonym) (e.g., dad→ father) (Coltheart).

Features described so far can be seen in four cases of Japanese students with RD, including two junior high school students reported by Dyslexia Clinic (1995). Case 1 (an 8th grader) was tested for his kanji abilities. Exposed to 996 elementary-level kanji characters with 2005 *on*- and *kun*-reading in total (see the previous *The Kanji System* section), his correct rate was 80% on average. He made many visual errors between similar kanji characters (e.g., 陸-陛). Confusion between *on*- and *kun*-reading was seen, too. Also, he tended to make associative SEs. For example, when he was exposed to a stimulus kanji character 批, he seemed to associate it with a kanji-word 批評(criticism or evaluation), then with another kanji-word 批判(criticism). At this point, he chose the kanji character not 批 but 判 that had three *on*-reading patterns (/han/, /pan/, and /ban/), and responded, /ban/ (the correct answer was /hi/ for the kanji 批).

Short memory deficits, impulsiveness, or misinterpretation of meanings might have affected his response.

Case 2 (a 9th grader) was tested for reading and writing 600 English words of grade 7 and 8 levels. (Official English instruction starts at grade 7 in Japan.) His correct rate was 50% on average with phonological errors in 135 words by applying the phonetic rules of the romaji system (see the previous *Mixture of Different Writing Systems* section). Visual errors were evident. For example, he made errors in letter-shape identification by sounding /diras/ for birds, /jad/ for job, and /bipa:tament/ for department. Letter-order replacements were seen as well. He read /ari/ for air, /majero/ for major, and /thri:s/ for theirs. According to Dyslexia Clinic, these types of errors are quite similar to those of English-speaking students with RD. Also, shared-featured SE might be related to Case 2. For example, he first seemed to recognize the stimulus word *letter* as the sound /léta/, and translate it into its Japanese relevant word 手紙, which was correct thus far. But he somehow picked out the kanji 紙 meaning "paper", and so responded. The last stage of his process for meaning (letter→paper) might be considered a superordinate SE.

The remaining two cases were the neuropsychological diagnoses of Case A and B (both are elementary school boys) reported by Koeda et al. (1986). Case A (a 2nd grader) could recognize individual kana and kanji characters. Kanji-character recognition was easier for him than hiragana-character recognition. But he failed to read a word and a sentence properly. Also, special phonetic sounds were quite difficult for him. He was diagnosed having auditory linguistic skills deficits. Case B (a 1st grader) performed poorly in individual kana recognition. Like Case A, kanji recognition

was easier for him than kana. The same pattern was seen in his writing. In sentence dictation, he could only write the first script in a few trials. He was diagnosed as having visual-auditory perception deficits. On the basis of these two cases, Koeda et al. (1986) conclude that children with RD tend to have difficulty processing visual and auditory information. Also, the researchers emphasize that the meaningfulness of kanji greatly helps children with RD compensate for their problems in reading and writing.

Chapter Summary

This chapter reviewed current literature regarding RD and LD with a focus on Japanese students. In Japan, academic attention had not been directed to LD until the 1990s. With regard to RD as the major characteristic of LD, accurate understanding of its prevalence and characteristics among Japanese children has been greatly hindered by the Japanese orthographic uniqueness. The kana system which has regular correspondence between script and sound, kanji characters' meaningfulness at sight, and the mixture of different writing systems to distinguish meaningful units in a sentence all help an individual read Japanese, but they contribute to problems experienced by students with RD (i.e., underestimation of RD prevalence rate and degree of RD severity).

However, brain research shows universality of RD occurrence independent of special features in orthography (Paulesu et al., 2001). Also, some surveys revealed Japanese children's phonological and sequential processing deficits which account for major characteristics of RD in general. The estimated range of the potential for Japanese children's having RD is 5-10%, which is the same as for North America (Dyslexia Clinic, 1995; Hirose & Hatta, 1988; Stevenson et al., 1982; Yamada & Banks, 1994). Unfortunately, relevant data to identify RD of Japanese children are still

insufficient. Further exploration of comprehensive characteristics of RD is crucial to improve learning environment for children with RD in Japan.

Purpose of the Study and Research Questions

To understand RD in Japanese children in a comprehensive manner, RD should be studied in relative to the areas of reading, writing, and cognition. In general, RD is said to cause deficiencies in symbolic-material processing, sequential processing, visual and/or auditory perception, visual- and/or auditory-information processing, and memory. The present study explored how these deficits that characterize RD are present in Japanese children with reading difficulty in reading, writing, and cognitive areas. Although little information about RD among Japanese children can be found in the literature, it seems clear that children with RD tend to read slowly, erroneously, and stumblingly. These weaknesses indicate children's insufficient phonological processing abilities, memory retention, and articulatory awareness. Reading special phonetic sounds seems to be challenging for children with RD because of the irregularity that requires phonological awareness. When the visual aid of mixed, differing types of writing systems is removed, the ability to distinguish meaningful units can be difficult for children with RD. Consequently, they cannot understand the content of the text (Yamada & Banks, 1994). As for writing, children with RD typically write sloppy, erroneous, short, and incoherent sentences. As with reading, special phonetic sounds seem to be taxing. Concerning cognitive areas, recalling of sequential symbolic materials and number manipulation are stumbling blocks to children with RD due to impaired memory skills and weaknesses in verbal labeling and meaningful processing.

Based on the RD-related problems suggested above, the major research question of

this study was "what are the characteristic features of reading difficulty among Japanese children?" In order to study reading difficulties in the Japanese language thoroughly, this study has explored the areas of reading, writing, and related cognitive problems of elementary school students in Japan. Comparison was made between students with and without reading difficulties.

Specific questions asked in the foregoing discussion are as follows: (1) What are the differences between students with and without reading difficulties in reading? (2) What are the differences between students with and without reading difficulties in writing? (3) What are the differences between students with and without reading difficulties in cognitive areas?

CHAPTER III

METHODOLOGY

In this chapter, the methods used in this study are described. The chapter begins with hypotheses of the study and a discussion of the study's design and participants. Following this, a description of the instrumentation used in the study is offered. The chapter closes with a summary of the data analysis procedures.

Hypotheses

The following hypotheses provided the basis for my study:

(1) Students with reading difficulties will perform at a lower level than students without reading difficulties in oral reading accuracy, oral reading rates, and comprehension.

(2) Students with reading difficulties will perform at a lower level than students without reading difficulties in both mechanical and structural aspects of writing.

(3) Students with reading difficulties will perform at a lower level than students without reading difficulties in cognitive skills, particularly short-term memory and sequential processing skills, as measured by the modified Bangor Dyslexia Test (Miles, 1993).

General Approach

The general qualitative approach is suitable to explore a particular situation from one or more perspective(s) to better understand it (Anderson & Arsenault, 2000). This qualitative method is designed to be used in conditions where: (a) detailed, in-depth information is needed; (b) diverse, unique qualities are exhibited by individuals; and (c) a

more holistic analysis of problems is needed (Mertens & McLaughlin, 1995). Because students' conditions of LD and RD are diverse and unique, a qualitative study provides "more detail about the uniqueness of the students' disabling conditions than do quantitative studies" (Mertens & McLaughlin, 1995, p. 46).

Qualitative Descriptive Research Design

A major purpose of qualitative descriptive studies is presenting the facts without a researcher's bias or inference (Sandelowski, 2000). "Description is an essential extension of data" (Anderson & Arsenault, 2000, p. 90,) and the benefit of using this method is to understand the state of the thing that typically is not studied or understood. Therefore, a qualitative descriptive design was suitable for this study in order to describe the less-known characteristics of reading difficulty among Japanese children.

The major limitation of qualitative description is interpretive validity, in other words, whether or not other researchers will obtain the same results (Anderson & Arsenault, 2000; Sandelowski, 2000). Likewise, internal and external validity is involved. Taking these concerns into account, the present study also used established procedures of measurement, which enabled the study to obtain consistent results and thus maximized the reliability. These measurement procedures provided quantitative information, which supported the evidence of reading difficulties, and such a use of quantitative data in qualitative studies is considered useful and often unavoidable (Anderson & Arsenault, 2000). Thus, the complementary use of qualitative and quantitative description was justified as a means to fully and validly present the content of the data.

Another limitation is that the generalizability of results would need to take into

account the limited number of participants (Anderson & Arsenault, 2000). Nevertheless, the results will contribute to the accumulation of related examples of reading difficulties in Japan.

Participants

Purposeful sampling technique was used to recruit participants. This technique is typically used in qualitative studies and its goal is "to obtain cases deemed info-rich for the purpose of study" (Sandelowski, 2000, p. 338). Seven students were selected as Group A: one 3rd grader (a boy), one 4th grader (a girl), one 5th grader (a boy), and four 6th graders (two boys and two girls) from a private institute (School D). Two of these seven students had been identified officially to have LD. School D aims at research on students with learning difficulties and reinforcement of their academic skill improvement. Students who have learning difficulties and/or who are diagnosed as having LD attend this school on their own and their parents' decisions. Due to the absence of a formal diagnostic tool to detect RD, no formal assessment for RD was conducted at the admission to this school. However, Group A students were suspected of having RD by their parents and the instructor of School D.

Seven students were selected as Group B: two 1st graders (a boy and a girl), one 2nd grader (a girl), two 4th graders (a boy and a girl), and two 5th graders (a boy and a girl) from a private elementary school (School S). The number of students in this group was matched with that of Group A. Children had passed the entrance exam to School S; therefore, no student in this group was expected to be a poor reader, nor have LD. Both schools were located in a city in the southwest of Japan.

The number of students in Group A was limited and, therefore, gender

specification was avoided in this study to maintain the maximum number of participants. Because linguistic awareness is affected by an individual's reading experience, comparing two groups in light of both the chronological age and the reading age, is important (Montgomery, 1981). This comparison was considered appropriate because the students in Group A were expected to perform more poorly when compared to their grade-matched peers. The average grade level of each group was grade 5.14 for Group A and grade 3.14 for Group B. If students in Group A were to perform more poorly than students in Group B in such a comparison, the result would reliably suggest the severity of their *reading disabilities*, not a mere *retardation*.

Prior to the researcher's visit to Japan to conduct this research, participants were selected by the teachers at both schools under permission of each principal (Appendix D and E). At School D, the teachers asked all elementary school students who had difficulties in reading whether they were interested in and willing to participate in this study. Those who had mental retardation and severe attention-deficit hyperactivity disorder (ADHD) were not included to avoid definitional and procedural complexity. Seven students and their parents consented to participate (Appendix F and G). At School S, teachers of designated grades explained the purpose and procedures of this study to students who were interested in and willing to participate in this study. Seven students and their parents consented to participate (Appendix F and G).

Instrumentation

The instruments used to collect data were: (1) Oral Reading test, (2) the Story Construction subtest from the Test of Written Language Third Edition (TOWL-3) (PRO-ED, 1996), and (3) the modified Bangor Dyslexia Test (BDT) (Miles, 1993).

Oral Reading Test

Oral reading is considered an effective tool to identify characteristic features of RD, because oral reading errors provide "evidences of influence of semantic and syntactic constraints" (Danks & Fears, as cited in Allington, 1984, p. 852), and oral production is successful after comprehension has occurred. Children with RD are known to have sequential processing deficits; therefore, their weaknesses can be demonstrated in oral reading in the forms of slowness, stumbling, and errors (Miles, 1993; Wodrich & Kush, 1990). Considering that Japanese is a pitch-accent language, incorrect intonations for a word can indicate an incomplete lexical access to the word (Stevenson et al., 1982; Yamada & Banks, 1994).

In this study, the original passage for the Oral Reading test was chosen from a Japanese drill book for 4th graders and rewritten into katakana-only text (Appendix A). This selected passage contained different special phonetic sounds with which RD children typically struggle (see Koeda et al., 1986). There were two reasons for adopting katakana-only text. One was to maintain the equity for all participants by eliminating the discrepancy of learned kanji at different grade levels. The other was to eliminate the visual familiarity of text. Under ordinary conditions, Japanese texts are written in hiragana for young children, but not in katakana. Therefore, katakana-only conditions must be more challenging for children in their decoding tasks since even words already learned (in kanji and hiragana forms) must be decoded from their equivalent katakana form (Yamada & Banks, 1994).

In order to verify the effectiveness of using a katakana-only text to measure one's phonological processing, the researcher conducted a pilot study in September 2002 with 8

native speakers of Japanese. They were students at a mid-sized university in the Pacific Northwest and had good reading abilities. The researcher asked them to read out both ordinary and katakana-only texts. All readers read katakana-only text much more slowly than the ordinary text. According to the students, this was because they had to process the meaning of words as they read. Thus, an individual's phonological processing skills seem to be challenged in a task of katakana-only text reading. Indeed, katakana-only texts are harder to process than ordinary and hiragana texts "eliciting longer fixation durations, shorter saccadic distances, and frequent occurrence of regressive eye movements" (Kess & Miyamoto, 1999, p.162). Consequently, katakana-only text at 4th-grade level would sufficiently challenge even participants in higher grades, and reasonably indicate an individual's reading difficulties.

With respect to the measuring procedure for the Oral Reading test, participants' reading performance was tape-recorded for later transcription, and scored. Here, a checklist which was established according to "Nandokuji-no tame-no tebikisho [A guidebook for dyslexic children]" (Dyslexia Clinic,1995) (Appendix A) was used. Children's oral reading was scored in terms of: (1) fluency, (2) intonation, (3) reading every letter (i.e., not omitting letters), (4) correct letter order, (5) correct letter identification, (6) pronunciation of special phonetic sounds, and (7) comprehension. In order to ensure the level of comprehension, children were asked the following two questions: (1) What is this passage about? (a typical answer was, "Dinosaurs.") and (2) What happened in the reading passage? (a typical answer was, "Dinosaurs became extinct.") The possible highest score was 14. The higher the score, the better was the

performance. Length of reading was timed in seconds and students' reading rate was measured as well.

Story Construction Test

Because the impact of RD can be widespread across literacy skills, it is reasonable to assess children's writing skills as well as reading skills. Children with dyslexia tend to display perceptual and motor problems, phonological processing deficits, and sequential processing difficulties in writing. In the present study, Story Construction subtest from TOWL-3 (PRO-ED, 1996) was used despite the fact that it is designed for English speaking students. The reason is that this subtest evaluates the quality of composition in terms of prose, plot, organization, and sequencing. Due to these features, this subtest can be applied to Japanese-speaking students.

As for the measuring procedure of the Story Construction test, participants were asked to write a story about a picture in which cavemen were fighting with mammoths (Appendix B) and students' writing samples were collected and scored. After students were shown the picture, they were advised to take time to plan a story with characters, a beginning, middle, and ending. The allocated time for writing was 15 minutes. Two types of scoring sheet were used for scoring each writing sample. First, the researcher established a scoring sheet according to "Nandokuji-no tame-no tebikisho [A guidebook for dyslexic children]" by Dyslexia Clinic (1995) (Appendix B). In order to assess children's mechanical aspects of letter and word use in writing, this scoring sheet consists of (1) size and shape of letters, (2) correct letter formation (no mirror image), (3) correct letter choice, (4) correct letter identification (no letter confusion), (5) correct writing of special phonetic sounds, (6) punctuation, (7) adequate use of kanji at grade level, and (8)

grammar. The possible highest score was 15. The higher the score, the better was the performance. The number of written letters was counted as well; however, punctuation marks were not counted. A special phonetic sound such as きゃwas counted as one letter (i.e., not きand や respectively). Here, it is important to note that writing more letters did not necessarily indicate a student's writing proficiency. This is because the ratio of kanji used in students' writing must be considered. For example, an individual can write the word "question" either in two kanji (質問) or in four kana (しつもん). That is, the more kanji included, the less the total number of letters can be. Also, as already referred to in the previous chapter, kanji-use is considered effective and necessary to understand Japanese text. (The expectation of kanji-use increases as grades move up.) Therefore, examining students' use of kanji was appropriate in terms of examining their adequacy to their individual grade levels[3]. The other scoring sheet was adopted from the TOWL-3 which has 11 items to assess student's structural aspects of writing (see Appendix B). Sequential processing or symbolic processing for meaning that is the major weakness of RD can be assessed. The possible highest score was 21. The higher the score, the better was the performance.

Modified Bangor Dyslexia Test (BDT)

The primary purpose of this test is to detect and identify the specific patterns of dyslexia in subjects' cognitive areas such as directions, numbers, and time (Miles, 1993). On the basis of a number of interactions with children with dyslexia and their parents, discussion with other researchers, and review of literature, the test items had been developed and modified over years till the validity of the test was confirmed. The present study used the modified version of BDT in which the total number of test items

was reduced and the test items were translated into Japanese, but "items that caught the spirit of the original" (Yamada & Banks, 1994, p. 109) were included.

The measuring procedure of the modified BDT included tape-recording students' oral performance for the further transcription, and scoring. The researcher read the questions and asked students to answer orally. Students' performance in left-right confusion was not tape-recorded since students responded physically on this subtest (e.g., raising a hand). Therefore, students' responses in this subtest were recorded on the scoring sheet by the researcher immediately. It was important for the researcher not to give false reassurance or misleading information to the participants during the test (e.g., telling participants that they had done well when it is not true) (Miles, 1993).

The subtests in the modified BDT were as follows (see also Appendix C):

Left-Right confusion. For example, a child was asked to touch the researcher's right hand with her or his right hand in a face-to-face condition. Frequency of hesitation, mirror imaging of left-right, and repeating questions may indicate that a child has verbal labeling problems (Miles, 1993).

Multiplication table. A child was asked to recite the 7X and 8X tables, and timed. This subtest was useful on the premise that children with RD often have weaknesses in verbal and auditory abilities that facilitate memorization (Wodrich & Kush, 1990). Notably, two 1st graders in Group A did not take this subtest because they had not yet been taught multiplication tables.

Counting backward by threes. A child was asked to count backward by threes from 96 and 88 respectively. This subtest was considered effective to reveal RD children's lack of instant memory and sequential processing skills (Miles, 1993; Wodrich

& Kosh, 1990).

Reciting syllabary backward. First, a kana syllabary string was read out by the researcher (*ta, chi, tsu, te, to*). A child was asked to say it backward (*to, te, tsu, chi, ta*) and timed. The purpose of this subtest was to measure a child's sequential processing skills.

Reversing digits. A digit string is read out by the researcher, and a child is asked to say it backward. For example, 2–8–9 should be answered 9–8–2. Four digit strings are given. The purpose of this subtest is to measure a child's sequential processing skills and immediate memory abilities.

Scoring of the BDT was as follows (see also Appendix C):

Left–right confusion. Individual responses to the separate five questions were scored by means of a three–point scale (0, 1, and 2) for each question. Hence, the possible score ranged from 0 to 10 for a child.

Multiplication table. The duration for completing each trial (7X and 8X table) was scored. The specified time for each table was 100 seconds. If a child failed to finish within the given time, another 100 seconds was given. If an error was made, the time for that part was doubled.

Counting backward by threes. The duration for completing each trial (96 to 75, 88 to 67) was scored.

Reciting syllabary backward. The duration for completing the trial was scored.

Reversing digits. The scoring of this subtest was the same as for left–right confusion. The score ranged for a child was 0 to 8.

In each subtest, an individual was determined either dyslexia–plus, zero, or

dyslexia–minus. A 'dyslexia–plus' was scored as 1.0. A 'zero' was scored as equivalent to half a 'plus'. The possible highest score was 5.0. The higher the score, the greater was the degree of reading disabilities.

Procedure

Recruiting participants for the study was accomplished with the cooperation of teachers at both schools. Before the commencement of the research, the researcher first contacted the principal at each school by letter (Appendix D). After the principals had agreed to their students' involvement in this study, the researcher sent information letters to the teachers at each school to ask them to recruit participating students on her behalf (Appendix E). After recruiting the participants, the teachers contacted the parents by telephone and then distributed the parent consent forms to be taken home to the parents (Appendix F). The parents were asked to sign on the form and return a copy to the researcher. Before testing, a participant consent form was read out to each student (Appendix G), who signed it if he/she consented to participate.

The testing was conducted from December 17th 2002 to February 22nd 2003. At the testing, a child and the researcher sat face–to–face in the one–to–one setting, in a classroom at either school. The testing took place after class at each school. The total time spent for the testing was 20 to 30 minutes per participant. The door of the classroom was kept locked during the testing so that no third persons (other students or teachers) would interrupt. Thus, the participants' anonymity was protected and distractions were avoided. The three tests were given to a student at once, successively. Before testing, individual students decided the order of the tests. As students performed in the three tests, the researcher informally observed and wrote down her impressions

about students' attitudes.

Data Analysis

Content analysis style (Anderson & Arsenault, 2000; Sandelowski, 2000), which qualitatively compared group differences in three tests was used with supplemental use of statistical analysis. Data was derived from the following sources: (1) tape recordings, (2) scoring sheets of the Oral Reading test, (3) scoring sheets of the Story Construction test, (4) students' writing samples, (5) scoring sheets of the modified BDT, and (6) the researcher's memos taken during the testing. An individual student's performance was described in detail if any specific differences (from students in the other group) were observed. Statistical analysis of group differences was made using the computer program, SYSTAT 9 for Windows. Due to the small sample size, nonparametric Mann-Whitney tests were used for group comparisons. The major advantage of using this test is that it requires less rigid assumptions concerning the shape of the sampled population(s); the disadvantage is lower statistical power (Howell, 1999). A one-tailed test ($\alpha = 0.05$) was employed to determine the statistical significance of the variables in question. The test statistics compare the sum of ranks between each group.

Chapter Summary

This chapter discussed research methodology in this study. The research took place in a city in the south-west of Japan, with a total of 14 elementary school students divided into two groups of 7 students each: a group of students with reading difficulties (Group A) and a group of students without reading difficulties (Group B). Three tests were used to both group members individually. A qualitative descriptive approach with

factual data analyses was used with supplementary use of quantitative data, since each test item had a scoring scale. The two groups were expected to show differences in light of typical and atypical features in reading-related skills of Japanese language at the elementary school level.

CHAPTER IV

RESULTS

This chapter presents quantitative and qualitative data characterizing features of RD among Japanese children according to the research questions: (1) What are the differences between students with and without reading difficulties in oral reading accuracy, oral reading rate, and comprehension? (2) What are the differences between students with and without reading difficulties in the mechanical aspects and the structural aspects of writing? (3) What are the differences between students with and without reading difficulties in cognitive areas, particularly short-term memory and sequential processing skills, as measured by the modified BDT? These questions are answered in the form of group comparison and individual descriptions of participants' performance on the Oral Reading test, the Story Construction test, and the modified BDT.

Oral Reading Test

Reading Time and Reading Rate in Oral Reading Test

Table 1 displays the average length of time that participants in each group spent on the Oral Reading test. The Mann−Whitney tests indicated no significant differences

Table 1

Reading Time and Reading Rate in Oral Reading Test

	Group A[c]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Reading time[a]	63.50	66.83	51.50	35.00	36.43	39.50	30.50
Reading rate[b]	1.30	1.84	40.00	2.50	3.07	65.00	12.00

Note. $n = 7$ for each group. [a]Reading time in seconds. [b]Number of letters per second. [c]One 3rd grader was not able to complete.

between Groups A and B. However, three students in Group A refused to take the test at first saying that they did not like reading. In contrast, all students in Group B, including two 1st graders who had not yet been taught all katakana letters at school, read the katakana-only text successfully in their first trial.

Therefore, the preceding three students in Group A were given a two-step practice before reading the katakana-only text: (1) reading aloud a hiragana-only text (the passage was the same as that of the katakana-text) and (2) a prior exposure to three katakana words in the reading passage (チキュウ, ナクナッタ, and キョウリュウ) both visually and auditory. Although this practice was not a part of the Oral Reading test, the students showed characteristic features of RD, such as reluctance in reading, weakness in decoding sound-letter corresponding, letter confusion, and incorrect understanding of special phonetic sounds. One of these three students had difficulty identifying individual letters and did not complete the test.

Including students who received the two-step practice, five students in Group A completed reading within a range of 57 seconds to 120 seconds (one student read in 15 seconds which tied with the fastest reader in Group B); whereas, only 1st graders in Group B spent more than 50 seconds (65 and 55 seconds respectively). Again, not all katakana letters are yet taught in grade 1. Taking this into account, it might be argued that Group A read more slowly than Group B.

Mechanical Aspects of Oral Reading Test

Significant differences were found with respect to fluency ($p < 0.005$), intonation ($p < 0.005$), reading every letter (no letter omission) ($p < 0.05$), correct letter identification ($p < 0.01$), pronunciation of special phonetic sounds ($p < 0.05$), and the

total score ($p < 0.005$) (see Table 2).

Table 2

Mechanical Aspects of Oral Reading Test

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Fluency	0.00	0.14	30.50	1.00	1.29	74.50	2.50***
Intonation	1.00	1.00	31.50	2.00	2.00	73.50	3.50***
Reading every letter	1.00	1.00	37.50	2.00	1.71	67.50	9.50*
Letter order	2.00	1.86	49.00	2.00	2.00	56.00	21.00
Letter identification	1.00	0.71	35.50	2.00	1.57	69.50	41.50**
Special phonetic sounds	1.00	1.00	40.50	2.00	1.57	64.50	12.50
Comprehension	2.00	1.29	44.50	2.00	1.86	60.50	16.50
Total	8.00	7.00	30.50	13.00	12.00	74.50	2.50***

Note. $n = 7$ for each group. The higher the *M* score, the better the performance. [a]One 3rd grader was not able to complete the test.

*$p < .05$. **$p < .01$. ***$p < .005$.

First, all participants seemed to have difficulty reading katakana-only text with fluency due to the text's unusualness. Yet, students in Group A read less fluently than students in Group B. Group A students read falteringly, sounded out letter-by-letter, had frequent mid-word pauses, and omitted or added letters. For example, one student in Group A read, トコ/ロガ/チキジョウジョウヨ/ワガ/モノ/ガオ/ニ (the underlined was incorrect). However, the correct word segmentation was, トコロガ/チキュウジョウヲ/ワガモノガオニ (meaning *however*, *on the earth*, and *proudly* respectively).

Thus, he omitted letters and added unnecessary letters as he segmented the sentence wrongly. As with preceding example, five other students in Group A stumbled at the word チキュウジョウ. This could be attributed to the visual similarity of チ and キ followed by a special phonetic sound component ュ and a long vowel component ウ successively.

The next aspect of faulty reading was that participants in Group A had less correct intonation than participants in Group B. Frequent mid-word pauses seemed to have caused students' incorrect intonation (see the previous discussion of fluency). Articulation errors seemed to take place as well; for example, one participant in Group A sounded /kiiyooryu/ for /kyooryuu/ (キョウリュウ). Likewise, she sounded /chiikyu/ for /chikyuu/ (チキュウ). Another student in Group A sounded the same words with a wrong stress.

Thirdly, students in Group A omitted more letters (e.g., ノシアルイテイタ→ノシアルイタ) than students in Group B as was reported in the earlier description of students' fluency. However, letters that formed special phonetic sounds were not omitted by any student. The visual prominence of special phonetic sounds (i.e., inclusion of a small sized letter) might have called students' attention to them.

Fourthly, students in Group A performed more poorly in correct letter identification. Visually similar letters such as チ-キ, ヤ-マ, ウ-ワ, and ヲ-ヨ seemed to be difficult for students in Group A to distinguish one from other. No student in Group A scored 2 out of a possible 2 in this part of the test. In Group B, 1st and 2nd graders scored 1 and others scored 2, which is understandable because katakana

instruction is completed by the end of 2nd grade in Japanese school curriculum. However, considering that Group A had no 1st and 2nd graders, their ability in letter identification should be better than that of Group B.

Another aspect of Group A students' poorer performance was pronunciation of special phonetic sounds. Although the pretest practice for three students in Group A might have temporarily improved their performance, Group A students performed more poorly than Group B students; only one 6th grader in Group A scored 2 out of a possible 2. Students in Group B, with the exception of 1st and 2nd graders, scored 2. (Again, katakana instruction is completed at the end of 2nd grade.) All students who scored 1 or 0 struggled especially with the contracted sounds such as キョ and ジョ when they were followed by ウ to end with a long vowel sound. These sounds were more difficult for young children to pronounce than other simple syllables. Two students (a 3rd and a 6th grader) in Group A had difficulty sounding silent moras correctly as well.

With two exceptions, Mann−Whitney tests found no significant differences with respect to correct letter order and comprehension. Regarding correct letter order, Japanese individual kana script, except special phonetic sounds, has a concrete correspondence to a sound; therefore, reversed letter order in a sentence is unlikely to happen. Only one student in Group A out of all participants showed this weakness by reading letters in a reversed order when visually similar letters appeared next to each other. In his case, basic katakana recognition was suspected to be insufficient, since he was unable to identify the individual katakana letters spoken out in the pretest practice. He was also unable to complete this test. Although no significant difference was found in comprehension, this result may have been attributed to the shortness of the reading

passage. Two students in Group A remained silent when they were asked two comprehension questions, although they had successfully read out the passage. This seemed to indicate that some students in Group A had difficulty processing the text for meaning.

In total, participants in Group A performed significantly less well than participants in Group B on the Oral Reading test. Typically, participants in Group A read in a hesitant and reluctant manner. Their articulation was frequently unclear and incorrect, especially when it came to reading special phonetic sounds. Visually and phonetically similar letters were confused frequently by these students. In addition, they seemed to be caught up with identifying individual letters and did not seem to process for meaning at the same time.

Story Construction Test

In general, Group A children did not take time to plan their stories. Three students showed reluctance about writing, and would not start right away. They colored the picture on the Story Construction test, talked to the researcher, or played with the pencils for several minutes. Being encouraged to write, they started to write without planning the story, and stopped writing soon. Three other students in Group A immediately started to write without planning and stopped writing in a few minutes. No student in Group A revised their stories. It is important to note that a 6th grader in Group A was unable to write at all. She could not even hold a pen, and looked embarrassed and angry until she was asked if she wanted to quit the test. Hence, she did not take this test.

In contrast, Group B children took time to plan their stories. While writing, they

seemed to think about the organization and the context. When finished writing, some students went over their work within the given timeframe.

Numbers of Letters

The Mann–Whitney test yielded a significant difference between the two groups in terms of the number of letters used by participants in their stories ($p < 0.05$) (see Table 3).

Table 3

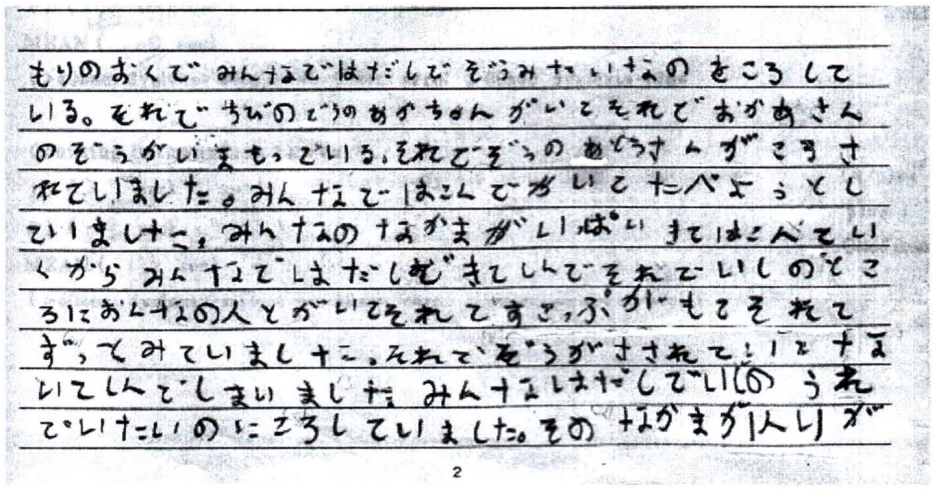
Numbers of Letters in Story Construction Test

Group A[a]			Group B			
Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
67.00	102.86	37.00	266.00	226.57	68.00	9.00*

Note. $n = 7$ for each group. The time given to each participant was 15 minutes. [a]One 6th grader was not able to write a story. *$p < .05$.

Here, the ratio of used kanji characters must be taken into account when evaluating the compositions (see Data Collection section in Chapter 3). Children in Group A tended to write more kana letters than the kanji characters learned at their grade–levels. For example, one 4th grader in Group A used only one kanji character, 人 (see Example 1).

Example 1



In contrast, a 1st grader in Group B had two kanji characters, 木 and 人. In

elementary school, 76 and 195 kanji characters (plus 416 kanji characters in the 2nd and 3rd grades) are taught for 1st and 4th graders, respectively (Kess & Miyamoto, 1999). Based on this curriculum requirement, the gap here between students in Group A and B was evident. Also, unnecessary kana scripts were frequent in Group A. For example, one 4th grader in Group A wrote 一人り for 一人 and 人と for 人. Two others in Group A made the same type of mistakes (e.g., をは for は, とか for が). This type of mistake was not found in students in Group B. Thus, the number of letters itself would have increased in the writing samples of Group A. Nevertheless, Group A wrote significantly fewer letters than Group B (M = 102.86 vs. M = 226.57).

Mechanical Aspects of Story Construction Test

Significant median differences were found with respect to correct letter choice ($p < 0.005$), correct letter identification (i.e., no letter confusion) ($p < 0.005$), punctuation ($p < 0.05$), kanji use ($p < 0.005$), grammar ($p < 0.005$), and the total score ($p < 0.005$) (see Table 4).

Table 4

Mechanical Aspects of Story Construction Test

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Letter size / shape	1.00	0.71	45.50	1.00	1.00	59.50	17.50
Letter formation	2.00	1.57	45.50	2.00	2.00	59.50	17.50
Letter choice	1.00	1.00	35.00	2.00	2.00	70.00	7.00***
Letter identification	0.00	0.57	31.50	2.00	2.00	73.50	3.50***

(table continues)

Table 4. (***continued***)

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Special phonetic sounds	2.00	1.14	44.00	2.00	1.86	61.00	16.00
Punctuation	1.00	1.00	40.00	2.00	1.71	65.00	12.00*
Kanji use	1.00	0.57	30.00	2.00	1.86	75.00	2.00***
Grammar	1.00	0.86	31.50	2.00	2.00	73.50	3.50***
Total	8.00	7.43	29.50	15.00	14.43	75.50	1.50***

Note. $n = 7$ for each group. The higher the *M* score, the better the performance. [a]One 6th grader was not able to write a story.

*$p < .05$. **$p < .01$. ***$p < .005$.

First, students in Group A made more mistakes in their letter choice than students in Group B. Two students in Group A made the same postposition errors writing お for を, which was likely to have happened because these two letters share the same speech sound /o/. Another student had に for を, を for は and put unnecessary よ next to を.

The next aspect of faulty writing was incorrect letter identification (i.e., letter confusion between similar scripts), and students in Group A showed confusion between visually/phonetically similar sounds. One student in Group A chose 四 for 匹. Another wrote れ /re/ for え /e/, and い /i/ for み /mi/. She also confused between で-ぞ, あ-お, て-で, ン-ソ, and も-き. Another student in Group A wrote し/shi/ for せ /se/, は /ha/ for ま /ma/. This type of mistake (i.e., confusion between phonetically and/or visually similar letters) was present in the writing samples of several

other children in Group A. This error was likely influenced by incorrect letter choice. No student in Group B made this type of mistake.

Thirdly, stories of Group A students lacked punctuation. Typically commas and brackets were absent; only periods were used. Therefore, their sentences were difficult to segment. This is because a Japanese sentence does not have spaces between words like that of English. One student in Group A included 74 letters in a sentence without commas or brackets as follows: みんなのなかまがいっぱいきてはこんていくからみんなではだしできてしんでそれでいしのところにおんなの人とがいてそれてすきっぷがもてそれてずっとみていました. In contrast, a typical student in Group B wrote as follows: なぜ、ぜつめつしてしまったかは、しりませんが、わかったことは、昔は、とてもかなしい時代だったことです. The latter was much easier to read.

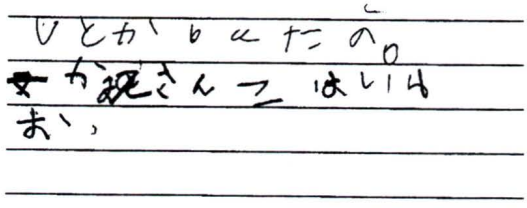
Another difference was kanji use (appropriate use of learned kanji characters at one's grade level). Participants in Group A wrote significantly less kanji characters than Group B. For example, one 6th grader in Group A wrote a word "stone" in hiragana scripts, いし. In contrast, one 1st grader in Group B wrote the same word in a kanji character, 石. Likewise, one 4th grader in Group A used hiragana scripts throughout her story except only one kanji character, 人. In comparison between students above grade 4, the used kanji rate was 6% for Group A (five students including three 6th graders) and 12% for Group B (two 4th and two 5th graders).

Weaknesses in grammar also characterized participants in Group A. Typically, students in Group A wrote short and simple sentences with incorrect transitional words or

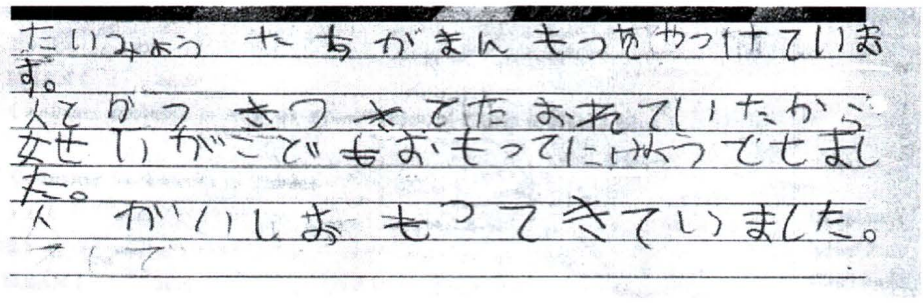
none at all. For example, a Group A student wrote それで (meaning *then*) frequently and randomly. Likewise, another student in Group A wrote そして (meaning *and*) at the beginning of three sentences consecutively. No other transitional words appeared in his story. Consequently, sentences had weak connections to each other. In addition, inaccurate word choice was typical for individuals in Group A. For example, one member of this group wrote, "They *broke* a mammoth." In contrast, students in Group B usually used more accurate verbs such as *killed* or *hunt* in order to describe the scene. In general, students in Group B wrote grammatically correct sentences, and communicated sequences with the use of appropriate postpositions and transitions.

With three exceptions, no significant differences were detected with respect to letter size/shape, correct letter formation (e.g., no mirror image), and special phonetic sounds. However, when it came to individual students' writing, some students in Group A showed distinguishable characteristics of RD. For example, letters written by some students in Group A (see Example 2 and 3) were almost illegible, crude, lined loosely, and poorly shaped.

Example 2

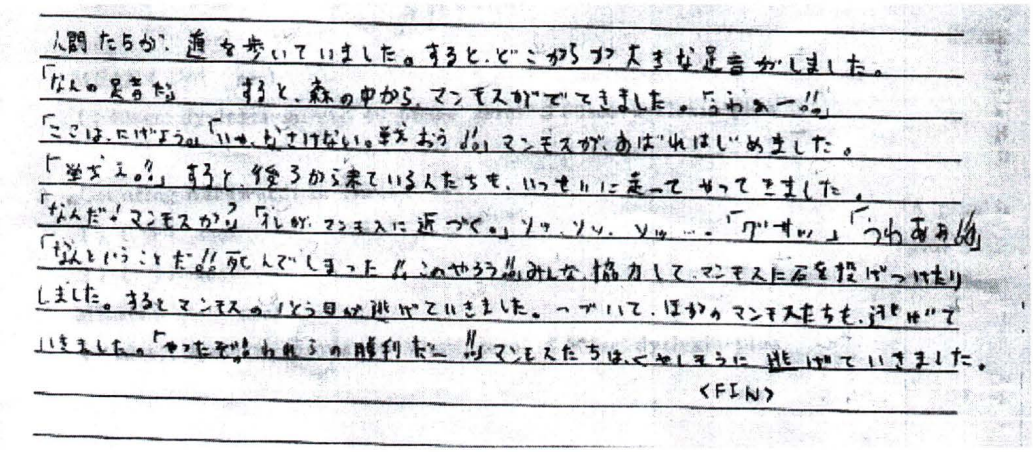


Example 3



In contrast, letters written by Group B students were neat and correctly shaped (see Example 4).

Example 4


人間たちが、道を歩いていました。すると、どこからか大きな足音がしました。
「なんの足音だ。」すると、森の中から、マンモスがでてきました。「うわぁー!!」
「ここは、にげよう。」「いや、だめだ。逃げおう!!」マンモスが、あばれはじめました。
「逆だえ。?」すると、後ろから来ている人たちも、いっせいに走ってかってきました。
「なんだ!マンモスか?」「私が、マンモスに近づく。」ソッ、ソッ、ソッ…「グサッ」「うわあぁ!!」
「死んでしまった!!このやろう!!」みんな協力してマンモスに石を投げつけたり
しました。するとマンモスの1とう目が逃げていきました。つづいて、ほかのマンモスたちも、逃げて
いきました。「やったぞ!われらの勝利だ!!」マンモスたちは、くやしそうに逃げていきました。
<FIN>

Regarding correct letter formation, the shortness of the stories by Group A writers must be taken into account. Stories by three students in Group A were too short to assess this aspect accurately. For example, one child had only three sentences. Nevertheless, it is important to note that another child had a letter rotation: つ→し. Besides, four students in Group A hardly wrote kanji characters. Most students in Group A did not write katakana scripts either. Therefore, further examination using Group A's longer writing samples including more kanji and kana letters and numbers was necessary.

Likewise, special phonetic sounds of Group A needed to be further examined using longer passages with more special phonetic sounds included. Students in Group A often failed to apply a diacritical mark when they wrote some special phonetic sounds; for example, they wrote き for ぎ. They seemed to have articulation problems as well. That is, in the Oral Reading Test, they articulated as follows: /kyo/ → /kyu/, /jo/ → /ju/, /tsuzu/ → /chizu/, and /kyoo/ → /kiiyoo/. Notably, a 4th grader in Group B wrote

some special phonetic sounds incorrectly (e.g., ぶぁ /bua/ for ば /ba/). It is difficult to decide whether this type of mistake is caused by RD or a subtle articulatory habit.

In total, Group A performed more poorly than Group B despite their higher grade-level. Insufficient understanding and acquisition of basic writing skills were evident in Group A students' stories. In addition to their short, sloppy, and erroneous writing, students in Group A frequently erased and started over. These are characteristics of RD.

Structural Aspect of the Story Construction Test

Nonparametric Mann-Whitney tests yielded significant median differences with respect to story beginning ($p < 0.005$), sequence ($p < 0.005$), plot ($p < 0.005$), characters ($p < 0.01$), moral or philosophical theme ($p < 0.005$), action level ($p < 0.01$), story ending ($p < 0.005$), prose ($p < 0.05$), story ($p < 0.005$), and total score ($p < 0.005$) (see Table 5).

Table 5

Structural Aspects of Story Construction Test

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Story beginning	1.00	0.57	32.00	2.00	1.71	73.00	4.00***
Relevance	1.00	0.86	49.00	1.00	1.00	56.00	21.00
Reference to an event	0.00	0.43	42.00	1.00	0.86	63.00	14.00
Sequence	1.00	0.71	33.50	2.00	1.86	71.50	5.50***
Plot	1.00	0.86	36.50	2.00	1.71	68.50	8.50***
Characters	1.00	0.57	36.00	1.00	1.43	69.00	8.00**
Story ending	0.00	0.29	32.50	2.00	1.71	72.50	4.50***

(table continues)

Table 5. (***continued***)

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Prose	0.00	0.43	38.50	1.00	1.00	66.50	10.50*
Story	0.00	0.43	32.50	2.00	1.57	72.50	4.50***
Total	7.00	6.43	29.50	15.00	16.57	75.50	1.50***

Note. $n = 7$ for each group. The higher the *M* score, the better the performance. [a]One 6th grader was not able to write.

*$p < .05$. **$p < .01$. ***$p < .005$.

First, students in Group A tended to have a weak or abrupt story beginning such as "There were Masao and village people" or "Mammoths and people are fighting." Group A students generally started their stories with a sentence to state the situation. In contrast, most students in Group B had a distinctive story beginning such as "Once upon a time," "One day," "It is autumn now," or onomatopoeia, "Vahooon!" in order to have an effective beginning.

Secondly, in story sequence, the poorer performance of children in Group A compared to children in Group B indicates the characteristic sequential processing deficit of RD. In general, stories by Group A children were too short to develop story sequence. Also, incorrect use of postpositions and transitions seemed to contribute to the poorer performance in story sequence of Group A children. For example, one 4th grader in Group A wrote:

> In a deep forest, people are killing something like an elephant. And a tiny baby elephant is there and the mother elephant is protecting her. And the father elephant is killed. Everyone was trying to carry (the father elephant) and eat. A lot of companies came and carry it and because people came in barefoot and dead and a woman is beside a stone and Skip came and looked at her for a long time. And an elephant was stabbed and cried and dead. Everyone was barefoot and got hurt on

the stone but they were killing. One of the companies was dead in the river.

In contrast, one 1st grader in Group B wrote:

> Long time ago, people tried to kill mammoths. But it was difficult. Mr. *Musashi* threw a stone to kill a mammoth. Mr. *Satoshi* tried to stab a mammoth with a long wooden stick. Some people died. But other people killed mammoth and, therefore, the rest was safe.

Another difference was detected in plot and prose. Group A participants' stories suffered from incoherence and randomness. Typically, a Japanese plot requires a four-part organization: *introduction*, *development*, *turn*, and *conclusion*. Due to the shortness of their stories, four students in Group A lacked *turn* and *conclusion*; therefore, their plot lacked thickness. Students in Group A did not seem to understand basic requirements of composition rules and lacked grammatical skills to develop a story. For example, one student in Group A wrote, "About 6,000,000 years ago, there were mammoths in Japan. Our ancestors hunt the mammoths for living. Mammoths went extinct because people hunt too many mammoths." His story had only three sentences and lacked the necessary four parts. Other students in Group A wrote choppy sentences or phrases by retrieving whatever came to mind. Their lack of knowledge about writing rules and story planning hindered the development of a story.

Fourthly, Group A writers did not sufficiently express characters' emotions or feelings and action level in their stories. Three students in Group A referred to the death of people in their stories, but no feelings or emotions were mentioned (e.g., "People died."). Also, Group A writers had fewer conversations and onomatopoeias; consequently, characters' emotions and feelings were hardly expressed. In contrast, Group B writers included words such as "afraid," "sad," "happy," "merrily," "regretfully," "definitely," "proudly," "Ahhh!" "Oh my!" and "Darn!" to express

characters' feelings and emotions.

Also, moral or philosophical theme and story (in general) were developed better by Group B children. Again, Group A children wrote significantly less with poorer skills to develop a story, and consequently, theme and story were hardly developed. For example, one participant in Group A wrote: "*Taimyo* and others are attacking mammoths. Because people were down, a woman had a child and wanted to run away. People had stones." In contrast, one participant in Group B wrote:

> People had a hard time in old days because they were not able to obtain food as easy as we can nowadays. When people went hunting, I presume that they were determined to sacrifice their lives. People must have died one after another. Also I think that animals that were hunted felt sad. People might not have wanted to kill animals. Nowadays, it is easy for us to obtain food which was difficult to have in those days. We do not have to sacrifice our lives to obtain food. And some animal people used to eat as food went extinct. I do not know why they had to go extinct; only I know is that the earlier days was a tough time.

The sixth aspect with a significant group difference was story ending. Notably, five students in Group A stopped writing in the given time frame; therefore, the result was not due to the time limitation, but lack of skills and attitudes. As with story beginning, stories by Group A tended to have an abrupt ending as follows:

> There were Masao and village people. They were hungry. Masao was not able to move because he was hungry. And thirty minutes later, they heard a voice, "Paoonnn." And there came mammoths out of woods. Masao and village people decided to break mammoths and eat them, and stabbed mammoths with spears.

Typically, stories by Group A writers tended to be short, incoherent, and random; consequently, the story endings were unlikely to be logical and definite. In contrast, all students in Group B used the maximum 15 minutes to finish writing. Except for a 1st grader who was unable to finish in 15 minutes, Group B students wrote a definite ending in their stories. By and large, stories by Group B children had an event that evolved

toward the end of the stories, and had a certain ending such as "The reason why mammoths went extinct is unknown, but only thing I know is that it was a sad period then."

With two exceptions, no significant group differences were obtained with respect to relevance (story somehow relates to picture) and reference to an event. These results indicate that most participants understood what the picture was about and what their task was. Nevertheless, the shortness of stories of students in Group A restricted the fair assessment of these aspects of writing. One child in Group A did not write at all, and another wrote only "mother." (His handwriting was difficult to decipher; therefore, the researcher presumed that he wrote "mother.") In another case, one 5th grader in Group A wrote only three sentences.

In terms of total writing score, Group A children performed significantly worse than children in Group B, despite their more advanced grade-level. Group A writers typically wrote short, random, and crude stories with choppy and blunt sentences. Seemingly, they wrote down whatever came into their minds without planning and text organization. Also, they hurried in writing and did not revise their work. In addition, infrequent use of both katakana (to express onomatopoeias and foreign words) and kanji characters and punctuation marks made their stories dull. After the test, the researcher asked three students in Group A what their stories were about. This is because their handwriting was difficult to read or their stories were difficult to decipher (see Example 2). Typically, children's explanations were pointless, long-winded, and unrelated to the picture in question. In contrast, Group B writers were more skilled in the mechanics of writing, story organization, and story development.

Modified Bangor Dyslexia Test

Mann–Whitney tests yielded significant median differences between groups with respect to counting backward ($p < 0.05$), reciting syllabary backward ($p < 0.05$), reversing digits ($p < 0.005$), and the total score ($p < 0.01$) (see Table 6).

Table 6

The Modified Bangor Dyslexia Test

	Group A[a]			Group B			
	Mdn	*M*	sum of ranks	*Mdn*	*M*	sum of ranks	*U*
Left–Right confusion	0.00	0.21	59.50	0.00	0.07	45.50	31.50
Multiplication tables	0.00	0.29	50.50	0.00	0.00	27.50	22.50
Counting backward	1.00	0.71	66.50	0.00	0.14	38.50	38.50*
Syllabary backward	1.00	0.71	65.50	0.00	0.21	39.50	37.50*
Reversing digits	1.00	0.86	70.00	0.00	0.14	35.00	42.00***
Total	3.50	2.79	71.00	0.50	0.57	34.00	43.00**

Note. $n = 7$ for each group. The higher the *M* score, the greater the degree of reading disabilities. [a]Two 1st graders did not take the multiplication tables subtest because they had not yet been taught multiplication tables.

*$p < .05$. **$p < .01$. ***$p < .005$.

One Group A student did not seem to understand the task of counting backward in 3s; he only counted backward without subtraction and did not remember where to stop. Another child in Group A remained silent on this test item. Moreover, in Group A, only one 6th grader completed this test item smoothly without asking where he was or when to stop. Some students in Group B also asked where they were when confused; however, they soon continued counting. Some students in both groups made mistakes in saying a

number (e.g., they said 80 for 70); however, the calculation process was more accurate with Group B students. Some students in Group A showed irritation because they frequently lost their places.

Secondly, reciting syllabary backward was most challenging for both groups. Some students in Group B also stumbled or were silent for several seconds between individual syllables. Two students made a mistake, because all schoolchildren in Japan overlearn syllabary strings and are used to saying a syllabary string in the correct order. In Group A, four students were not able to answer this test item correctly. One student immediately said, "Don't know." Another participant asked to repeat the question three times and then said, "I don't know." One child repeated to himself, "ta chi tsu te to" and remained silent for 30 seconds, then said, "to te chi ta." Yet, another student remained silent and did not answer at all.

Thirdly, in reversing digits, six students in Group A remained silent or made mistakes on questions that had four- or five-digit numbers; whereas, most students in Group B answered more correctly. Two 6th graders in Group A showed irritation and frustration as they tried to recall the numbers. Another student struggled, looked upset, and flapped the table in front of her. She frequently asked that the questions be repeated. At question #3, she said, "Say what? Once again?" When the digit in question was repeated, she said, "Oh, yes." and looked as if she had forgotten her task (to recite the digits backward). Participants in Group B answered the questions more carefully and thoroughly than participants in Group A. Most students answered correctly except one 4th grader who had three wrong answers out of four questions. Taking into account that she scored dyslexia-minus in other subtests in BDT and performed well in the Oral

Reading test and the Story Construction test, she did not have RD.

Overall, students in Group A scored more pluses ("dyslexia-plus" as explained in Chapter 3) than students in Group B (see Table 7).

Table 7

Distribution of "Pluses" in a Possible Five in BDT

Score	Group A	Group B
0.0	1	3
0.5	0	1
1.0	0	2
1.5	1	1
2.0	0	0
2.5	0	0
3.0	1	0
3.5	2	0
4.0	1	0
4.5	1	0
5.0	0	0

Note. $n = 7$ for each group. The higher the score, the greater the degree of reading disabilities.

When it came to the percentages in each group who scored plus on a given item, Table 8 indicates that the left-right and multiplication tables showed less difference than the other three items.

Table 8

Percentages of Group A and Group B Who Scored "Plus" on the Five Items in BDT

	Left-Right %	Multiplication Tables %	Counting Backward %	Syllabary Backward %	Reversing Digits %
Group A	29	29	71	71	86
Group B	7	0	14	21	14

Note. $n = 7$ for each group. The higher the percentage, the greater the degree of reading disabilities.

That Japanese children are thoroughly taught left–right and multiplication tables in the initial two years in elementary school may have accounted for the small percentage of *pluses* in Group A. (Mann–Whitney tests did not yield significant differences in left–right and multiplication tables.) Yet, when it came to individual students' performance in Group A, a 3rd and a 4th grader were unable to complete multiplication tables. (Students are taught multiplication tables at grade 2 and are required to recite each table within 10 seconds.) Except for one 6th grader who quickly and correctly recited multiplication tables, children in Group A recited the multiplication tables with uncertainty and less confidence.

In terms of the total score of the modified BDT, participants in Group A had more pluses than participants in Group B. Except for the multiplication tables, students' grade levels did not seem to affect their abilities to answer. Consequently, three items (counting backward, reciting syllabary backward, and reversing digits) seemed to be good indicators of possible RD (not mere retardation), as was indicated with the survey results of Yamada and Banks (Miles, 1993). This result suggests that children in Group A had more difficulty in short–term memory and sequential processing.

Chapter Summary

The results showed that children in Group A had significantly performed less well than children in Group B in the Oral Reading test, the Story Construction test, and the modified BDT. In the Oral Reading test, both groups had more difficulty reading the katakana-only passage due to its unusual presentation. Special phonetic sounds, visually and/or phonetically similar letters, and infrequently used letters (e.g., ヲ) were especially challenging for both groups to read. Typically, participants in Group A spent more time reading, looked tense and reluctant, and did not recognize their mistakes as they read. They read slowly, sounded out letter-by-letter, with incorrect pauses and intonation. Some students had unclear and incorrect articulation. In contrast, participants in Group B read faster, corrected mistakes by themselves, and moved on. In other words, they seemed to use prediction skills as they read to process for meaning.

Secondly, in the Story Construction test, Group A children performed less well than Group B students in both mechanical and structural aspects of writing. Group A writers showed impulsiveness, reluctance, distraction, and boredom when they wrote. In contrast, Group B children took time to plan their stories and made the most of the given time. Also, Group A students tended to write extremely short stories, have unnecessary letters, and have fewer katakana and kanji characters. Typically, they presented blunt, incoherent, low-key, and less sequential stories. In contrast, Group B students presented skilled, coherent, vivid, and sequential stories with adequate use of kanji characters and knowledge of grammatical rules.

Finally, in the modified BDT, Group A students showed less well performance than Group B students in some cognitive tasks. Among a total of five test items,

reciting syllabary backward was challenging for both groups since students were used to recite the original syllabary. When challenged, Group A children typically showed either irritation or impulsiveness (e.g., gave a wrong answer without thinking or said "I don't know" immediately). Whereas, Group B children carefully thought and answered. Typically, when short-term memory and sequential processing were challenged, Group A students showed marked weakness compared to Group B students.

CHAPTER V

CONCLUSION

Discussion

The purpose of this study was to explore and describe the characteristic features of reading difficulty among Japanese children that are interchangeable with RD characteristics, and to contribute to the accumulation of relevant data on RD which is currently lacking in Japan. However, Japanese societal and school indifference toward RD restricted this study from having a sufficient number of participants who had reading difficulties. Notably, certain criteria and procedures for RD assessment are missing in Japan due to the insufficient study of this issue. Despite these limitations, some important information was obtained from this study. Results from the present study revealed marked weaknesses of students with reading difficulties (with an average grade level of 5.14) compared to students without reading difficulties (with an average grade level of 3.14) in reading, writing, and cognitive tasks. Discussion of findings in each area is presented in this chapter. Then, implications for both teaching and research concerning RD among Japanese children are offered.

What Are the Differences Between Students With and Without Reading Difficulties in Reading?

The challenge of reading katakana-only text revealed Group A students' overall weaknesses in reading compared to Group B students. Group A students showed reluctance, tenseness, impulsiveness, and lack of enthusiasm for reading; on the contrary, Group B students showed excitement and enthusiasm for reading an unfamiliar text. Such negative attitudes for reading of Group A students are considered typical of RD

(Dyslexia Clinic, 1995; Miles, 1993; Oota et al., 2001; Ozaki et al., 2000; Sakai, 1999; Sakai City Educational Board, 2001; Willows, 1991). Typically, Group A students labored to identify each katakana-letter and to segment letters into words. Notably, three out of seven students in this group were unable to read at all at their initial exposure to the text. In general, katakana mastery takes more time and is more challenging compared to hiragana mastery, but by the age of eleven, reading skills of hiragana, katakana, and kanji letters are supposed to be evened out (Tanaka as cited in Kess & Miyamoto, 1999). The three students' ages were 10, 12, and 12 and should have achieved this balance.

Another RD characteristics shown by Group A children were: (a) difficulty identifying letters, (b) confusion between similar-looking letters, (c) failure to segment words, (d) slow reading, and (e) letter-by-letter reading. These characteristics were consistent with some studies. For example, Japanese children who cannot identify individual kana and kanji letters are reported (e.g., Koeda et al., 1986). According to Yamada and Banks (1994), children with RD lack effective decoding and sequential processing. The authors thus refuted Makita's suggestion (1968) for a correlation between Japanese orthographic and low estimated RD existence in Japan.

In detail, all students in Group A and 1st and 2nd graders in Group B seemed to have difficulty reading the word, キョウリュウ (dinosaur), which had two contracted sounds: /kyo/ and /ryu/ followed by a long vowel sound /u/ respectively. Special phonetic sounds break the Japanese basic rule of one-to-one correspondence between a kana script and a sound (see Chapter II), and thus, they are often stumbling blocks to children with RD (Hirayama et al., 2000; Ueno & Muta, 1992). Taking into account

that some students in Group A had incorrect and unclear articulation such as /ki-yoo-ryu/ for /kyoo-ryuu/, the students' difficulty sounding out special phonetic sounds may be related to their deficits in phonological processing, auditory perception, or articulatory information processing, which are other indicators of RD (Griffiths & Frith, 2002; Oota et al., 2001). Thus, Group A students' struggling over this word was a strong indicator of their having RD.

Word-segmentation deficits of children with RD (Catts as cited in Miles, 1993) were also seen in Group A students. In particular, they tended to focus more on individual letter identification than on meaningful segmentation of letters. This tendency is considered as a feature of RD (Ishibe & Yanagimoto, 2001: Ozaki et al., 2000; Sakai City Educational Board, 2002; Ueno & Muta, 1992; Uno, n.d.). Despite Group A students' efforts to identify individual letters, their letter identification was significantly poorer than that of Group B students'.

Another feature shown by Group A students was that distinguishing between visually and/or phonetically similar letters such as チ /chi/ and キ /ki/ was taxing for the students. They did not recognize making mistakes. Willows (1991) associates such confusion between similar-looking letters with visual processing deficits (i.e., visual perception and visual memory deficits). Also, visual- and auditory-information disconnection and short-term memory deficits often account for confusion between similar-looking letters (Koeda et al., 1986; Oota et al., 2001; Ozaki et al., 2000; Taylor & Taylor, 1983; Ueno & Muta, 1992; Uno, n.d.). Here, short-term memory is one of the four components of cognitive processes. Among these processes (i.e., sensory register, short-term memory, working memory, and long-term memory), RD is said to have

deficiencies in short-term memory in terms of verbal rehearsal (strategic repetition of information to recall the information later) and phonological coding (processing information into sound units) (Swanson & Cooney, 1991; Taylor & Taylor, 1983).

In contrast to Group A participants, individual letter identification did not seem to be a major focus for participants in Group B while reading. They identified individual letters more correctly than Group A participants in the first place. Also, they could decide how to segment letters into meaningful words. They seemed to remember what they had read; thus, were able to go back to the former mistake and correct when they recognized the awkwardness or meaninglessness. This ability indicates that they had language-processing skills consisting of four aspects: (1) speech perception skills to distinguish word differences, (2) vocabulary skills (e.g., letter naming and word decoding), (3) phonetic structure to hold visually or auditory presented materials in short-term memory, and (4) grammatical and sentence-comprehension skills (Mann, 1991). Apparently, Group A children lacked these skills.

Unlike this in Group A children, Group B children might have used prediction skills as well, taking into account that 1st graders (they had not yet been taught all katakana letters officially) read relatively smoothly with correct comprehension despite making some mistakes in letter identification. Prediction skills are crucial to understanding a written text, because one establishes hypotheses as he/she reads in order to understand the meaning and make links to the following parts (Ueno & Muta, 1992). However, children with RD typically lack this skill (Ueno & Muta), and Group A participants did not seem to use prediction skills with their letter-by-letter reading. Although the present study had a short text (89 letters) to test children's reading abilities,

it is assumed that participants in Group A might have difficulty reading and understanding longer and more complex text. (Two students in Group A did not understand the meaning of the text in the present study.)

Thus, reading aloud a katakana-only text revealed Group A children's poorer letter identification, phonological decoding/encoding deficits, and lack of processing for meaning. Also, Group A children's articulatory problems might indicate these students' auditory-perception and/or visual-information processing deficits.

What Are the Differences Between Students With and Without Reading Difficulties in Writing?

Literature suggests that RD should be recognized as both reading and writing disabilities categorized as: mechanical aspects and structural aspects (Hirayama et al., 2000; Oota et al., 2001; Uno, n.d.; Willows, 1991). In both aspects, participants in Group A performed much more poorly than participants in Group B, showing some universal characteristics of RD such as: (a) reluctance in writing, (b) hurrying through writing with little planning, (c) telling whatever comes to mind, (d) a story containing few ideas and little elaboration, (e) terminating writing with choppy and short phrases, (f) struggling with the mechanics of writing, (g) missing important part(s) of a story, and (h) inordinate shortness of a story (Graham, Harris, & Larsen, 2001; Graham, Harris, MacArthur, & Schwartz, 1991). These characteristics were not found in students in Group B. As with the Oral Reading test, students in Group A showed reluctance, impulsiveness, and distraction while writing. Notably, one 6th grader in Group A did not even hold a pen and refused to write. Such dislike toward writing is a feature of RD and might develop into further problems such as leaving school. The reason is that

Japanese instruction in a classroom usually demands of students a great amount of handwriting and copying from the blackboard (JALD, 1997).

Such dislike can be attributed to Group A children's difficulties handwriting. Group A students' handwriting was sloppy, loose, and erroneous (see Example 2 and 3 in Chapter IV) perhaps due to kinesthetic problems. Similarly, JALD (1997) reports a case in which a 5th grader wrote a story with unclear segmentation of sentences and illegible letters. These are characteristics of RD, and are impossible to be compensated for by the ordinary classroom instruction; therefore, the problems are likely to remain (Oota et al. 2001). In contrast, Group B students wrote relatively neat, lined, and legible letters. Also, Participants in Group A tended to add unnecessary strokes to letters, include inappropriate kana scripts, and confused visually and/or phonetically similar letters. These mistakes were not seen in the writing samples of Group B students. In general, such writing disabilities are analyzed as follows: (a) visual perception or space perception deficits (difficulty correctly forming or copying letters), (b) visual memory deficits (difficulty memorizing shape of letters), (c) auditory memory deficits concerning sound–script correspondence, (d) auditory recognition deficits (difficulty distinguishing between phonetically similar sounds), (e) difficulty decoding a word into sounds, and (f) memory deficits (difficulty remembering meaning of kanji characters) (Oota et al., 2001; Ozaki et al., 2000).

Students in Group A may fall into one or more of the preceding categories. For example, one 4th grader who omitted silent moras may have auditory memory deficits. She might have auditory recognition deficits as well if we take into account that she was confused between phonetically similar sounds. One 6th grader who wrote unnecessary

strokes and omitted diacritic marks might have visual memory deficits. Another 6th grader who was often confused between visually and/or phonetically similar letters (e.g., ン and ソ) might have visual perception or auditory memory deficits.

Another characteristic of Group A students' writing was few kanji characters, katakana scripts, and numbers. Some reasons for few kanji characters are considered. Since there is no analytic correspondence between grapheme and sound in the kanji system, mnemonic strategies of grapheme–meaning correspondence are important in kanji learning (Sasanuma, 1980; Stevenson et al., 1982; Yamada, 1992). Therefore, a Japanese writer must retrieve the appropriate match of sounds and their equivalent kanji characters. Also, usually kanji characters have more complex component structures than kana scripts. This is why writing order and number and/or position of strokes are important when learning kanji characters. Because RD children typically have memory deficits and perceptual problems, few kanji characters may be a result of Group A writers' having RD. Group A children's failure to include many katakana scripts and numbers might be attributed to the shortness of the stories. Nevertheless, children's mastery level of katakana remains questionable if we take into account the poorer performance of Group A participants in the Oral Reading test.

In general, Group A writers did not understand basic writing rules and grammar; whereas, Group B writers including 1st graders showed appropriate understanding of orthographic and grammatical rules. In Group A students, punctuation and the use of transitions were inadequate. Also, several members of this group had postposition errors by assigning an alternative letter of the same speech sound such as お for を. In addition, weakness in phonetic spelling as one of the characteristics of RD (Willows,

1991) was suspected of Group A students according to their infrequent use of special phonetic sounds. Such weaknesses and dislike of writing might have reduced Group A children's opportunity to practice, or the lack of instruction and opportunity to practice might have added to their dislike toward writing. Whichever was the case, stories by Group A writers were not only short and choppy but also disconnected and incoherent due to their insufficient mechanical skills.

Consequently, processing for meaning was not apparent in stories by Group A children. With respect to the structural aspects of writing, cognitive processes for skilled writing require (1) planning, (2) text production, and (3) reviewing. In addition, the individual must be able to switch back and forth between the three processes (Graham, et al., 1991). Here, skilled writers can (a) effectively access their memories and outside sources, (b) organize and sequence their ideas, (c) produce sentences, and (d) apply the requirements of writing rules (Graham et al., 1991). However, students with RD have (1) difficulty accessing their memories, (2) immature or ineffective writing strategies, (3) primary problems in producing text, and (4) insufficient knowledge about writing. The results of the present study indicate that these features of RD seemed to apply to Group A children in general. Typically, Group A writers did not take time to plan and review their crude and extremely short stories. Exceptionally, one 4th grader wrote a relatively long story (see Chapter IV), but the words, phrases, and sentences were either disconnected or wrongly connected so that the story did not make much sense.

Such absence of sequence in Group A stories might result from the writers' insufficient understanding of the functions of some syntactic morphemes (i.e., postpositions and endings of verbs and adjectives), which communication in the Japanese

language heavily relies on (Taylor & Taylor, 1983). Although, the short and choppy sentences of Group A children seemed to conceal their problems in those syntactic morphemes. Nevertheless, when we take into account Group A writers' insufficient composition skills, it is assumed that they have difficulty with the morphemes. In Japanese speech communication, most postpositions are uttered in a short length of time and are likely inaudible, or are even omitted. Therefore, when a child with RD has auditory perception deficits, the mastery process of Japanese language from listening to people around him/her must be difficult (Oota et al., 2001). Also, it is natural to presume that children in Group A had difficulty using syntactic morphemes properly if we take into account that children with RD typically have difficulty in processing for meaning (Miles, 1993; Yamada & Banks, 1994).

In general, the shortness of the stories by Group A participants hindered the overall examination of their writing abilities. Nevertheless, some typical miscues and students' attitudes were important findings. These characteristics, combined with the results of the Oral Reading test, suggest that students in Group A had difficulties in distinguishing visually and/or auditorily similar letters, using special phonetic sounds, understanding basic requirements of the Japanese language, and processing for meaning.

What Are the Differences Between Students With and Without Reading Difficulties in Cognitive Areas?

Group A children performed much more poorly than Group B children in three test items in the modified BDT: counting backward, reciting syllabary backward, and reversing digits. These results are in accord with Yamada and Banks (1994). The three test items require auditory–verbal memory and phonological skills (to process

speech sounds meaningfully); therefore, the poorer performance of Group A children indicate their short-term memory deficit for spoken words (i.e., auditory-verbal short-term memory deficits), which is a common characteristic of RD (Coltheart, 1980). Also, the results indicate Group A children's poorer verbal labeling skills (i.e., the ability to treat nonsense sounds as meaningful words), which is another characteristic of RD (Miles, 1993).

In the present study, Group A participants showed slowness and weakness at processing symbolic verbal material especially on reciting syllabary backward and counting backward by 3. Reciting syllabary backward was challenging in the same sense (i.e., unfamiliarity) as katakana-only text reading. Three students remained silent or said "Don't know." One student gave a wrong response with stumbling and unclear articulation. Several students in Group B looked perplexed as well, but all of them recited the syllabary backward more quickly than Group A students. Two students made mistakes, but their articulation was clear. On counting backward, other characteristics of RD were discovered in Group A students such as: (a) basic weakness over calculation and (b) uncertainty over the details of the number series (Fuchs & Fuchs, 2001; Miles, 1993; Smith & Rivera, 1991; Takano & Watanabe, 2001). Because students must recall the number they had said in order to calculate the following number, their ability in both calculation and verbal memory seemed to be challenged validly. Typically, Group A children were unable to remember the preceding number, remained silent or took more pauses between numbers compared to Group B students, became bored or tired in the middle, needed encouragement and prompting to go on, and asked more questions during testing (e.g., asking where they are). Some students quit in the

middle.

Similarly, on reversing digits subtest, students in Group A performed much more poorly than students in Group B. More students in Group A asked the researcher to repeat questions, made more mistakes, or remained silent. Some students showed irritation or frustration having difficulty retaining the digits and reversing order. Therefore, they seemed to say any number that came to mind. Most students were unable to remember how many figures in original digits. In contrast, Group B students responded more quickly and thoroughly. None of them said, "Don't know" like Group A students. Although some students made mistakes, all students were able to remember figures in original digits. Miles (1993) reports that his patients with RD commonly show weakness in recalling auditorily-presented digits. If we take this into account, the attitudes and responses of Group A students could be affected by their RD.

Thus, despite having a small number of participants that restricted this study to detect the prevalence rate of children with RD in Japan, the present study discovered characteristic features (i.e., pattern) of Japanese children with reading difficulties through Group A children's (a) slow, faltering, and erroneous oral reading, (b) lack of basic knowledge and skills of mechanical and structural aspects of writing, and (c) auditory-verbal symbol processing deficits tested in the modified BDT. These features or patterns were attributed to deficits of kinesthetic control, spatial perception, visual perception, auditory perception, visual-auditory processing, sequential processing, and short-term memory. These are RD features common for children with RD in English speaking countries, and are present irrespective of orthographic difference. In short, the notion of rarity of RD existence in Japan (e.g., Makita, 1968) must be corrected by

educators and researchers.

Implications for Intervention

Although features of RD presented in Group A students must have been observed in the classroom, these students received no special education services or extra support from their teachers. Such indifference by the teachers is likely related to insufficient research on RD in Japan and to the lack of a formal RD definition and assessment tool. Without prevention and intervention at the earlier stage, RD persists into an individual's adulthood and crucially affects his/her life. In North America, earlier identification and intervention of RD prior to the manifestation of problems has become an educational goal (see Chapter II). In Japan, in order to prevent the persistence of poor reading and avoid secondary reading problems such as overall academic failure and lowered self-esteem and self-confidence, teachers must have knowledge of RD and intervene properly. Intervention with suitable practices, training, and exposure (to appropriate stimulus) allow children with RD to achieve compensational strategies to greatly improve their reading and other learning skills (Miles, 1993; Yamada & Banks, 1994).

For effective intervention, first, teachers need to be provided with sufficient information concerning RD such as the nature of RD, detecting signs of RD, and assessment. The present study revealed various RD signs such as: dislike of reading and writing, slow and letter-by-letter reading, inadequate understanding of orthographic rules, incorrect identification and formation of letters, writing choppy and incoherent sentences, unclear and incorrect articulation in speech, uncertainty over numbers and sequential symbols, etc. (The problem differs from one child to another.) After a teacher has noticed that a child is having some of these problems, careful observation is necessary in

order to understand accurately the patterns and degree of the child's specific difficulties. Then, formal assessment and individualized and appropriate intervention should follow (Dyslexia Clinic, 1995; Ishibe & Yanagimoto, 2002; Lerner, 2000).

Although the assessment service of RD in Japan is lacking currently, intervention must take place as long as a child has reading difficulties. Typically, children with RD have difficulties in visual- and/or auditory-information processing, mnemonic skills, and information processing for meaning. Therefore, it must be taxing for children with RD to map visual, verbal, and auditory symbols into meaningful units and to retain and retrieve the processed information. Intervention must take these RD characteristics into account. Yamada (2001) emphasizes that systematical reading practice with a focus on children's interests and meaning-oriented reading activities are effective for reading improvement. Also, systematic training in making links between letters and sounds is crucial for children with RD (Miles, 1993). Thus, reinforcement of the concept of *linkage* (i.e., letting meaningless symbols convey meaning) should be included in instruction for children with RD.

When linking between sounds and letters, educators must understand that children with RD have difficulty with understanding abstract ideas compared to non-RD children, and therefore, their learning should be supported by concreteness (e.g., a child writes a letter on the sand as he repeats after a teacher sounding out the letter) (Hirayama et al., 2000; Lerner, 2000). Here, a basic principle of learning advanced by Comenius (1658) that "if possible, may everything be perceived by all senses together" (as cited in Prokop, 1997) seems to play a critical role. That is, learning through a combination (or a linkage) of listening, seeing, reading, and writing is effective. Children with RD often

have intrinsic problems that restrict them from adequate listening, seeing, reading, or writing; however, the notion of linked learning is still important.

Another clue for instruction is repetition. Hotta (1984) reports that kana letters frequently used in daily life are easy to learn for young children, who unconsciously try to connect a speech sound to a letter by repeatedly listening to the same sound (Ooishi, 1982). Hotta (1984) argues that even special phonetic sounds, with which children in Group A had extreme difficulty, can be learned efficiently if they appear frequently in conversation and illustrated books. In fact, in the present study, the pretest practice for three students in Group A, which focused on several special phonetic sounds, temporarily enhanced their reading skills. Teachers should understand the general nature of RD and the specific RD conditions of individual children, and then intervene with an emphasis on repetition and making linkages for meaning-association.

Implications for Research

Patterns of suspected RD in Japanese children were examined in the present study in order to prompt awareness of educators and contribute to RD definition and assessment procedure establishment. Although this study emphasized the weaknesses of children with reading difficulty in order to clarify patterns of suspected RD, studies focusing on the strengths of those with RD will promote better understanding of RD since people with RD often have special talents due to the imbalance of skills (Dyslexia Clinic, 1995; Miles, 1993; Sakai, 1999). Studies with a large number of participants are necessary in order to better understand the distribution and the pattern of Japanese RD. At the same time, case studies and qualitative studies are important in order to deepen the

understanding of the uniqueness and individuality of RD. For both quantitative and qualitative studies, development of assessment procedures to detect RD accurately and efficiently is needed. With respect to a valid assessment tool, this study considered the modified BDT a useful tool to detect RD, in line with Yamada and Banks (1994). To be used with this modified BDT, the researcher recommends future research to develop and verify oral reading tests and composition tests, which measure the presence and nature of RD in individual

Even though formal definitions or means for diagnosis and evaluation were not available, the present study found that Japanese children with reading difficulties have reluctance in reading and writing, insufficient understanding of orthographic rules, phonological processing deficits, uncertainty over number, and memory deficiency. These features have been identified as RD characteristics of English-speaking students. Specifically, special phonetic sounds used in Japanese are related to English morphoneme decoding/encoding. Morphonological transcription regards words as "sequences of systematic phonemes in such a way as to preserve the basic units of meaning" (Mann, 1991, p. 132). Taking into account that children with RD often have difficulties phonological coding, reading ability tests with a focus on special phonetic sounds will be effective in the accurate assessment of RD in Japanese language speakers.

Another suggestion for the future research is children's confusion between similar-looking/sounding letters, which might indicate their deficiencies in visual perception, auditory perception, visual- and auditory-information processing, and articulation. These are also RD characteristics. Also, results of the present study suggest that the four-phased language-processing skills (i.e., speech perception, vocabulary, phonetic

structure in short-memory, and grammar and sentence comprehension) (Mann, 1991) is lacking in students with suspected RD as in English speaking students with RD. Research on the preceding areas will be crucial. Eventually, researchers can facilitate the development of definitions, criteria, and tools for RD assessment.

Thus, it is reasonable to assume that (a) Group A children were experiencing some RD features, despite that the Japanese orthography tends to conceal RD manifestation and (b) research on Japanese RD can share many things in common with research based in English using countries despite orthographic differences. As the literature suggests, studies on RD in North America need (a) to clarify and unify an RD definition and (b) to reconsider the use of the IQ score and the cutoff point for educators' decision making for special education service provision. Eventually, these actions will become controversial in the field of Japanese education as studies on RD progress. It is recommended for researchers of Japanese RD to be open to international research on RD, and to be cautious in the interpretation of information, while taking into account some specific features of Japanese language. It is particularly important that research avoid stigmatizing people with RD. It is hoped that the findings from this study will provide useful information to help children with RD, and their families, as well as educators and researchers.

FOOTNOTES

[1]The Japanese Ministry of Education changed its name to the Ministry of Education, Culture, Sports, Science and Technology in 2001; however, the former name will be referred to in this study as most governmental intervention took place before 2001.

[2]The Japanese Ministry of Health and Welfare changed its name to the Ministry of Health, Labor and Welfare in 2001; however, the former name will be referred to in this study for the same reason as with the Ministry of Education.

[3]"Gakunenbetsu kanji haitoohyoo" (kanji allocation chart for 6 grades) by Japan Foundation for Educational and Cultural Research was referred to.

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APPENDIX A

Oral Reading Test

Please read the following passage loud:

トコロガ、チキュウジョウヲ　ワガモノガオニ　ノシアルイテイタ

[tokoroga, chikyuujoowo wagamonogaoni noshiaruiteita]

キョウリュウガ、チキュウカラ　スガタヲケシテシマウ

トキガキマス。

[kyooryuuga, chikyuukara sugatawokeshiteshimau tokigakimasu.]

ナガクツヅイタ　キョウリュウノジダイガ、トツゼンオワッテシマッタノハ、ホントウニフシギデス。

[nagakutsuzuita kyooryuunojidaiga, totsuzenowatteshimattanowa, hontoonifushigidesu.]

(However, the time came when the dinosaurs that had swaggered around proudly on the earth became extinct. It is amazing that the long-lasted age of the dinosaurs ended abruptly.) (text cited from "Shoogaku Gakuryoku Koosa: Kyoojun Test no Kokugo Yonen"[Japanese Achievement Test for Fourth Graders] by Kyoogaku Kenkyuusha, n.d.).

Oral Reading Analysis Checklist

(1) Fluency (0=faltering, letter-by-letter, mid-word pause; 1=intermediate; 2=fluent)

(2) Intonation (0=frequently incorrect, 1=partially correct, 2=correct)

(3) Reading every letter/no letter omission (0=infrequent, 1=partial, 2=always)

(4) Correct letter order/no transition error (0=infrequent, 1=partial, 2=always)

(5) Correct letter identification (e.g., ゐ and わ) (0=infrequent, 1=partial, 2=always)

(6) Pronunciation of special phonetic sounds (0=incorrect, 1=partially correct, 2=correct)

(7) Comprehension

(a) What are these sentences about?

(0=incorrect, no response; 1=correct)

(b) What happened to dinosaurs?

(0=incorrect, no response; 1=correct)

TOTAL SCORE from (1) to (7) (/14)

Length of reading time (seconds)

Reading rate (time in seconds/89 letters) ( )

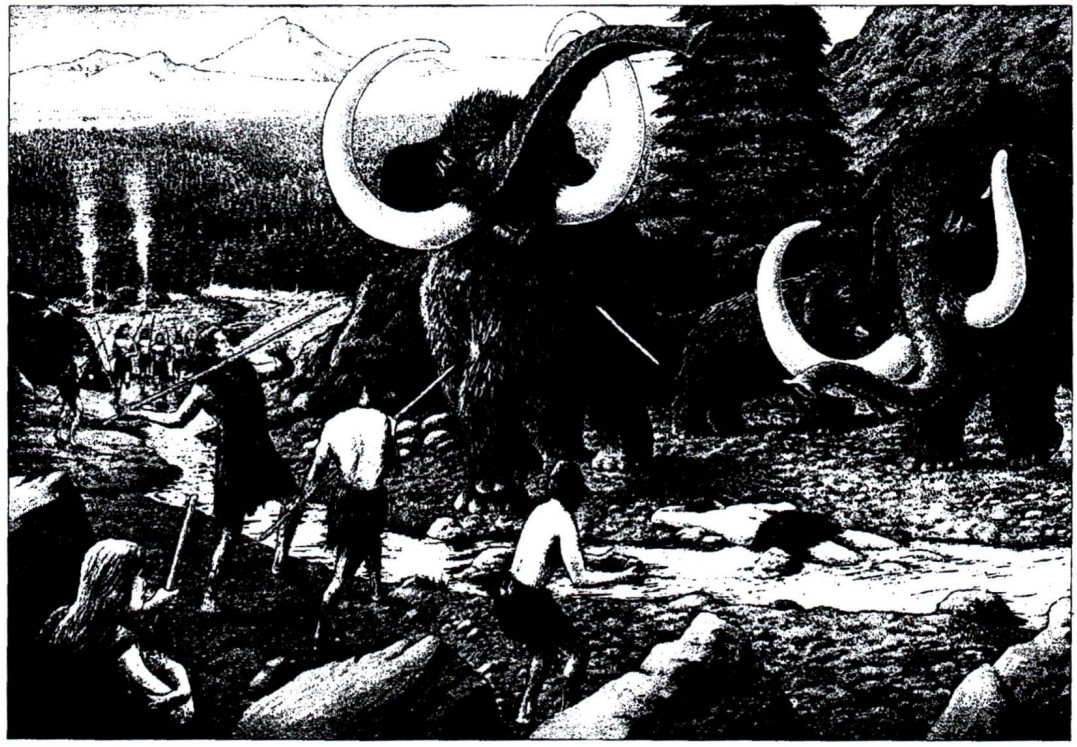
Items (1) through (7): cited from "Nandokuji-no tame-no tebikisho [A guidebook for dyslexic children]" by Dyslexia Clinic (1995).

APPENDIX B

Story Construction Test

Please write a story about the picture below in 15 minutes.

STORY



Mechanical Aspects Checklist of Story Construction Test

(1) Size and shape of letters (0=irregular, 1=neat)

(2) Correct letter formation (No mirror image) (0=infrequent, 1=partial, 2=always)

(3) Correct letter choice (0=infrequent, 1=partial, 2=always)

(4) Correct letter identification (No letter confusion) (0=infrequent, 1=partial, 2=always)

(5) Correct use of special phonetic sounds (0=incorrect, 1= partially correct, 2=correct)

(6) Punctuation (0=incorrect, 1=partially correct, 2=correct)

(7) Use of Learned Kanji (0=inadequate, none; 1=partial; 2=adequate at grade level)

(8) Grammar (0=incorrect, 1=partially correct, 2=correct)

TOTAL SCORE (/15)

(9) Number of letters (letters)

(1)-(8) Cited from "Nandokuji-no tame-no tebikisho [A guidebook for dyslexic children]" by Dyslexia Clinic (1995).

Structural Aspects Checklist of Story Construction Test

(1) Story beginning

(0=none, abrupt; 1=weak, ordinary, serviceable; 2=interesting, grabbing)

(2) Story somehow related to picture (0=no, 1=yes)

(3) Definitely refers to a specific event occurring before or after the picture

(0=no, 1=yes)

(4) Story sequence

(0=none, a series of random statements; 1=rambles, but has some sequence; 2=moves smoothly from start to finish)

(5) Plot

(0=none, incoherent, statements in random order; 1=weak, meager, spotty; 2=logical, complete)

(6) Characters show feelings/emotions

(0=no; 1=yes, but weakly stated, inferred; 2=overtly, clearly stated)

(7) Expresses some moral or philosophic theme

(0=no; 1=yes, but weakly stated, inferred; 2=overtly, clearly stated)

(8) Story action or energy level

(0=no action; 1=boring, tedious; 2=run-of-the-mill, predictable; 3=exciting, interesting)

(9) Story ending (0=none, abrupt; 1=weak; 2=logical, definite ending)

(10) Prose is (0=immature; 1=ordinary, serviceable, matter-of-fact; 2=artful, stylish)

(11) Story is

(0=dull, merely describes picture; 1=simple, straightforward; 2=interesting, unique, coherent)

TOTAL SCORE (/21)

Cited from Test of Written Language, 3rd Edition (TOWL-3) (PRO-ED., 1996) Section V. Story Scoring. Subtest 8 "Story Construction"

APPENDIX C

Modified Bangor Dyslexia Test

1 Left-Right (body parts) Confusion

1) Show me your right hand.

2) Show me your left ear.

3) Touch your right ear with your left hand.

4) (Putting hands on table) Which is my right hand?

5) Touch my left hand with your right hand.

2 Multiplication Tables

1) Say your 7 X time table.

2) Say your 8 X time table.

3 Counting Backwards in Threes

1) from 96 to 75 [96, 93, 90, 87, 84, 81, 78, 75]

2) from 88 to 67 [88, 85, 82, 79, 76, 73, 70, 67]

4 Reciting Syllabary Backwards

Say "ta, chi, tsu, te, to" in a reversed order.

5 Reversing Digits

1) 2 8 4 [4 8 2]

2) 6 5 2 9 [9 2 5 6]

3) 1 6 2 9 [9 2 6 1]

4) 3 4 7 1 9 [9 1 7 4 3]

バンガーディスレクシアテスト（Japanese）

1　左右認知

1）右手を出して。

2）左耳を見せて。

3）左手で右耳を触って。

4）私の右手はどっち。

5）右手で私の左手を触って。

2　九九

1）７の段。

2）８の段。

3　数を３つ置きで逆に数える

1）９６から（７５まで）[96, 93, 90, 87, 84, 81, 78, 75]

2）８８から（６７まで）[88, 85, 82, 79, 76, 73, 70, 67]

4　系列処理

たちつてと、を逆に言って。[とてつちた]

5　数字逆反復

1）２８４　[４８２]

2）６５２９　[９２５６]

3）１６２９　[９２６１]

4）３４７１９　[９１７４３]

Cited from (1) “Dyslexia: The Pattern of Difficulties” by T. R. Miles (1993)

(2) “Evidence for and Characteristics of Dyslexia among Japanese Children” by J. Yamada and A. Banks (1994).

Scoring Sheet of the Modified Bangor Dyslexia Test

1 Left-Right (body parts) Confusion

(0 = incorrect or no response; 1 = correct response with hesitation;
2 = correct response without hesitation)

1) (0, 1, 2)

2) (0, 1, 2)

3) (0, 1, 2)

4) (0, 1, 2)

5) (0, 1, 2)

TOTAL SCORE ( )

(≦7: dyslexia-minus; 6-4: zero ≧3: dyslexia-plus)

2 Multiplication Tables

1) (sec)

2) (sec)

MEAN (sec)

(>40sec: dyslexia-minus; 40-59sec: zero; ≦60sec: dyslexia-plus)

3 Counting Backwards in Threes

1) (sec)

2) (sec)

MEAN (sec)

(>40sec: dyslexia-minus; 40-59sec: zero; ≦60sec: dyslexia-plus)

4 Reciting Syllabary Backwards

(sec)

(>15sec:dyslexia-minus; 15-19sec:zero; ≦20sec:dyslexia-plus)

5 Reversing Digits

(0 = incorrect or no response; 1 = correct response with hesitation;
2 = correct response without hesitation)

1) (0, 1, 2)

2) (0, 1, 2)

3) (0, 1, 2)

4) (0, 1, 2)

TOTAL SCORE ( )

(≦4: dyslexia-minus; 3: zero ≧2: dyslexia-plus)

Table Example of Scoring

Case #.	L-R	Tab.	C.B.	S.B.	R.D.	TOTAL
1	0	-	+	-	0	2.0

Categories

L-R: Left-Right Confusion

Tab: Multiplication Tables

C.B.: Counting Backwards in Threes

S.B.: Reciting Syllabary Backwards

R.D.: Reversing Digits

A 'plus' is scored as 1.0. A 'zero' is scored as equivalent to half a 'plus.'

Cited from "Dyslexia: The Pattern of Difficulties" by T. R. Miles (1993)

APPENDIX D

Information Letters to the Principals

Harumi Ototake
2-1-11 Tonda-choOkayama, Japan
phone:(086)223-2368
date:

Dear Principal at School S

Re: Research Concerning the Reading Disabilities Among Japanese Children

This letter is a request for a permission to access your students to have them participate in my thesis entitled, "Characteristic Features of Reading Disabilities Among Japanese Children." I am a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria. I am an alumna of your school, but have no formal, professional connection to you. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn at a higher level. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

Research of this type is important because the presence of RD is said to be difficult to detect in Japanese language that has some unique characteristics. Therefore, hardships of many children with RD are likely to be overlooked both at school and home, and attributed to their lack of effort and laziness. The understanding of characteristics of RD among Japanese children is important for educators to plan suitable instructional methods and remove pressure and misconceptions on children with RD. Resulting information from this study will contribute to accumulate the relevant data in the field of RD in Japan.

In this study, I will invite the participation of two groups of students, one with reading difficulties and one without, for the purpose of contrast and comparison. I am inviting the students from your school to participate in the comparison group of students without reading difficulties. The other group will be from a private institution that focuses on research and instruction of children with learning difficulties. While there is no indication that your students have any reading difficulties, their inclusion in the study will be useful for the purpose of comparison with students at School D who are suspected to have such difficulties.

All students in two groups will be asked to take the same set of tests and the results will be qualitatively described. I am going to administrate the following tests to each student individually, after school, in a classroom at your school. All test items are minimized to avoid students' fatigue. The test will take about 30 minutes in total. During the testing, the classroom door will be kept locked to

avoid interruption by a third person.

(a) Reading ability test (tape-recorded, individually administered)

(b) Oral Reading (tape-recorded, individually administered)

(c) Writing a story

Concerning the selection of the participating students, I will ask the teachers of first, second, fourth and fifth grade to recruit a total of 7 students on my behalf. The students are expected to have average reading skills for their grade levels and be willing to participate in this study. I will provide teachers with a letter to explain this study and the participant selection process. After teachers have selected the students, they will contact the students' parents by telephone. If the parents agree their children being involved in this study, teachers will distribute the participant consent forms to be taken home to parents.

Your students' participation in this research must be completely voluntary. If they decide to participate, they may withdraw at any time without any consequences or any explanation. If they do withdraw from the study I will use their partial data collected from the performance, only if their parents(s) agree to this.

In order to assure that students are continuing to give their consents to participate in this research, before testing, I will explain to them individually that (1) their name will be changed in my thesis to protect their identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not be shared with their classroom teachers or affect them in any case but help the researcher and other children, and (4) they can quit anytime if they do not feel comfortable.

In terms of protecting your students' anonymity I will not use their name in my thesis but I will give a number to each student instead. I would like to ask you to keep participating students' information confidential. A third person will not be able to watch or hear the testing. Students' confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I will be the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of one year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. Parent(s) will be provided with the information resulting from this study in a form of a summary report.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand and accept the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Principal	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Dear Principal at School D,

Re: Research Concerning the Reading Disabilities Among Japanese Children

This letter is a request for a permission to access your students to have them participate in my thesis entitled, "Characteristic Features of Reading Disabilities Among Japanese Children." I am a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria. I do not have any formal, professional connection to you. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn at a higher level. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

Research of this type is important because the presence of RD is said to be difficult to detect in Japanese language that has some unique characteristics. Therefore, hardships of many children with RD are likely to be overlooked both at school and home, and attributed to their lack of effort and laziness. The understanding of characteristics of RD among Japanese children is important for educators to plan suitable instructional methods and remove pressure and misconceptions on children with RD. Resulting information from this study will contribute to accumulate the relevant data in the field of RD in Japan.

In this study, I will invite the participation of two groups of students, one with reading difficulties and one without, for the purpose of contrast and comparison. I am inviting the students from your school to participate in the subject group of students with reading difficulties. The comparison group will be from School S, a private elementary school.

All students in two groups will be asked to take the same set of tests and the results will be qualitatively described. Details of your students' performance will be compared with those of students at School S. If there will be any typical characteristics in your students' performance that is atypical in School S students, those characteristics will be considered characteristic features of RD. I am going to administrate the following tests to each student individually, after school, in a classroom at your school. All test items are minimized to avoid students' fatigue. The test will take about 30 minutes in total. During the testing, the classroom door will be kept locked to avoid interruption by a third person.

(a) Reading ability test (tape-recorded, individually administered)
(b) Oral Reading (tape-recorded, individually administered)
(c) Writing a story

Concerning the selection of the participating students, I will ask the teachers to contact all elementary school students. Students those who have ADHD and

mental retardation will be excluded taking into account the manageability of the procedures. I will provide teachers with a letter to explain this study and the participant selection process. After teachers have selected the students, they will contact the students' parent by telephone. If the parents agree their children being involved in this study, teachers will distribute the participant consent forms to be taken home to parents.

Your students' participation in this research must be completely voluntary. If they decide to participate, they may withdraw at any time without any consequences or any explanation. If they do withdraw from the study I will use their partial data collected from the performance, only if their parents(s) agree to this.

In order to assure that students are continuing to give their consents to participate in this research, before testing, I will explain to them individually that (1) their name will be changed in my thesis to protect their identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not be shared with their classroom teachers or affect them in any case but help the researcher and other children, and (4) they can quit anytime if they do not feel comfortable.

In terms of protecting your students' anonymity I will not use their name in my thesis but I will give a number to each student instead. I would like to ask you to keep participating students' information confidential. A third person will not be able to watch or hear the testing. Students' confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I am the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of a year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. Parent(s) will be provided with the information resulting from this study in a form of a summary report. Only if the parent(s) permit, you and teachers at D&L School will be provided the information resulting from this thesis.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand and accept the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Principal	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

APPENDIX E
Information Letters to the Teachers

Dear Teachers at School S

Re: Research Concerning the Reading Disabilities Among Japanese Children

This letter is a request for a permission to access your students to have them participate in my thesis entitled, "Characteristic Features of Reading Disabilities Among Japanese Children." I am a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria. I am an alumna of your school, but have no formal, professional connection to you. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn at a higher level. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

Research of this type is important because the presence of RD is said to be difficult to detect in Japanese language that has some unique characteristics. Therefore, hardships of many children with RD are likely to be overlooked both at school and home, and attributed to their lack of effort and laziness. The understanding of characteristics of RD among Japanese children is important for educators to plan suitable instructional methods and remove pressure and misconceptions on children with RD. Resulting information from this study will contribute to accumulate the relevant data in the field of RD in Japan.

In this study, I will invite the participation of two groups of students, one with reading difficulties and one without, for the purpose of contrast and comparison. I am inviting the students from your school to participate in the comparison group of students without reading difficulties. The other group will be from a private institution that focuses on research and instruction of children with learning difficulties. While there is no indication that your students have any reading difficulties, their inclusion in the study will be useful for the purpose of comparison with students at the School D who are suspected to have such difficulties.

I would like to ask you to recruit students on my behalf. I need a total of 7 students: a boy and a girl from first grade, a girl or a boy from second grade, a boy and a girl from fourth grade, and a boy and a girl from fifth grade. These students should have average reading skills for their grade levels. Please explain the following procedures to the students who are interested in and willing to participate in this research. After you have selected the participants, please contact their parents by telephone. If the parents agree their children being

involved in this study, please distribute the participant consent forms to be taken home to parents.

Students will be asked to take the same set of tests and the results will be qualitatively described. I am going to administrate the following tests to each student individually, after school, in a classroom at your school. All test items are minimized to avoid students' fatigue. The test will take about 30 minutes in total. During the testing, the classroom door will be kept locked to avoid interruption by a third person.

(a) Reading ability test (tape-recorded, individually administered)

(b) Oral Reading (tape-recorded, individually administered)

(c) Writing a story

Your students' participation in this research must be completely voluntary. If they decide to participate, they may withdraw at any time without any consequences or any explanation. If they do withdraw from the study I will use their partial data collected from the performance, only if their parents(s) agree to this.

In order to assure that students are continuing to give their consents to participate in this research, before testing, I will explain to them individually that (1) their name will be changed in my thesis to protect their identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not be shared with their classroom teachers or affect them in any case but help the researcher and other children, and (4) they can quit anytime if they do not feel comfortable.

In terms of protecting your students' anonymity I will not use their name in my thesis but I will give a number to each student instead. I would like to ask you to keep participating students' information confidential. A third person will not be able to watch or hear the testing. Students' confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I am the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of one year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. Parent(s) will be provided with the information resulting from this study in a form of a summary report.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand and accept the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Teacher	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Dear Teachers at School D,

Re: Research Concerning the Reading Disabilities Among Japanese Children

This letter is a request for a permission to access your students to have them participate in my thesis entitled, "Characteristic Features of Reading Disabilities Among Japanese Children." I am a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria. I do not have any formal, professional connection to you. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn at a higher level. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

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In this study, I will invite the participation of two groups of students, one with reading difficulties and one without, for the purpose of contrast and comparison. I invite the students from your school to participate in the subject group of students with reading difficulties. The comparison group will be from School S, a private elementary school.

All students in two groups will be asked to take the same set of tests and the results will be qualitatively described. Details of your students' performance will be compared with those of students at School S. If there will be any typical characteristics in your students' performance that is atypical in School S students, those characteristics will be considered characteristic features of RD. I am going to administrate the following tests to each student individually, after school, in a classroom at your school. All test items are minimized to avoid students' fatigue. The test will take about 30 minutes in total. During the testing, the classroom door will be kept locked to avoid interruption by a third person.

(a) Reading ability test (tape-recorded, individually administered)
(b) Oral Reading (tape-recorded, individually administered)
(c) Writing a story

I would like to ask you to recruit the students on my behalf. I need elementary school students at your school. Those students who have ADHD and mental

disorder will be excluded taking into account the manageability of the procedures. Please explain the following procedures to the students who are interested in and willing to participating in this research. After you have selected the students, please contact their parent by telephone. If the parents agree their children being involved in this study, please distribute the participant consent forms to be taken home to parents.

Your students' participation in this research must be completely voluntary. If they decide to participate, they may withdraw at any time without any consequences or any explanation. If they do withdraw from the study I will use their partial data collected from the performance, only if their parents(s) agree to this.

In order to assure that students are continuing to give their consents to participate in this research, before testing, I will explain to them individually that (1) their name will be changed in my thesis to protect their identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not be shared with their classroom teachers or affect them in any case but help the researcher and other children, and (4) they can quit anytime if they do not feel comfortable.
In terms of protecting your students' anonymity I will not use their name in my thesis but I will give a number to each student instead. I would like to ask you to keep participating students' information confidential. A third person will not be able to watch or hear the testing. Students' confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I am the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of one year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. Parent(s) will be provided with the information resulting from this study in a form of a summary report. Only if the parent(s) permit, you and teachers at D&L School will be provided the information resulting from this thesis.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand and accept the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Teacher	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

APPENDIX F
Consent Forms to Parents of the Participants

Dear parent or guardian (of School S),

Your child is being invited to participate in a study entitled, "Characteristic Features of Reading Disabilities Among Japanese Children" that is being conducted by Harumi Ototake. Harumi Ototake is a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria and you may contact her if you have further questions by phone: (086) 223-2368 or E-mail to: harri@uvic.ca. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca. Also, Ms. Kazuko Nagahara, vice principal of School S, may be reached at (086) 252-1486.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn to a greater extent. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

Research of this type is important because the presence of RD is said to be difficult to detect in Japanese language that has some unique characteristics. Therefore, hardships of many children with RD are likely to be overlooked both at school and home, and attributed to their lack of effort or laziness. Consequently, the children are in danger of losing their self-esteem and self-confidence. Thus, the understanding of characteristics of RD among Japanese children is important. Understanding the characteristics of RD will help educators plan suitable instructional methods and remove pressure and misconceptions on children with RD.

The information provided by your child will be significant in order to help children who are suffering from their reading difficulties. It is essential to accumulate data explaining individuals' overall reading characteristics at different levels so that educators may be aware of children's difficulties beyond their efforts, and plan necessary educational services for the children. While there is no indication that your child has any reading difficulties, her/his inclusion in the study will be useful for the purpose of comparison with students elsewhere who do have such difficulties.

If you agree to your child's voluntary participate in this research, her/his participation will include the following:

(a) Reading ability test (tape-recorded, individually administered)
(b) Oral Reading (tape-recorded, individually administered)
(c) Writing a story

Participation in this study may cause some inconvenience to a child, by the way of

the time commitment needed for the testing and performance. In order to minimize children's feeling tired and overwhelmed, the test items will be restricted to the minimal in order to shorten the total time spent for testing. The test will take place after school in a classroom at School S and will take 30 minutes. I will administrate the tests on an individual basis. The door will be kept locked during the testing so that no third person will interrupt. The results will not be shared with classroom teachers or used to evaluate your child in any way. There are no known or anticipated risks to children by participating in this research. Your child may indirectly benefit from the study when the study result is made known to educators. Improved teaching methods are likely to happen which can help many children, including yours.

Your child's participation in this research must be completely voluntary. If she/he does decide to participate, he/she may withdraw at any time without any consequences or any explanation. If she/he does withdraw from the study I will use her/his partial data collected from the performance, only if you agree to this.

In order to assure that your child is continuing to give her/his consent to participate in this research, before testing, I will explain to her/him verbally that (1) her/his name will be changed in my thesis to protect her/his identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not affect her/him in any case but help the researcher and other children, and (4) she/he can quit anytime if she/he does not feel comfortable.

In terms of protecting your child's anonymity I will not use her/his name in my thesis but I will give a number to your child instead. The principal and teachers at School S will keep all information concerning participating students confidential. A third person will not be able to watch or hear the testing. Your child's confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I will be the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of one year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. You will be provided with the information resulting from this study in a form of a summary report. Prior to the completion of my M.A. thesis, you will have the option to inquire about the test results of your child.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Parent	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Dear parent or guardian (School D),

Your child is being invited to participate in a study entitled, "Characteristic Features of Reading Disabilities Among Japanese Children" that is being conducted by Harumi Ototake. Harumi Ototake is a graduate student in the department of Curriculum and Instruction, Faculty of Education at the University of Victoria and you may contact her if you have further questions by phone: (086) 223-2368 or E-mail to: harri@uvic.ca. If you have further questions you may contact my supervisor, Dr. Lily Li-Chu Dyson, Faculty of Education, Department of Educational Psychology and Leadership Studies by phone: (250) 721-7816 or E-Mail to: ldyson@uvic.ca. Also, Mr. Seiichi Tsuda, principal of School D, may be reached at (086) 256-0630.

The purpose of this research is to bring the characteristics of Reading Disabilities (RD) among Japanese children into light. Due to the current insufficient recognition of and research into RD in Japan, there seem to be many children who are not properly understood nor helped and consequently miss opportunities to learn to a greater extent. Therefore, the objective of this study will be to gain a comprehensive understanding of RD from the aspects such as reading and writing abilities and other pattern of difficulties with special focus on Japanese language system. It is important to note that this study will not aim at sorting out children with RD, but understanding the nature of RD in the Japanese context for the future educational planning.

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The information provided by your child will be significant in order to help children who are suffering from their reading difficulties. It is essential to accumulate data explaining individuals' overall reading characteristics at different levels so that educators may be aware of children's difficulties beyond their efforts, and plan necessary educational services for the children.

If you agree to your child's voluntary participate in this research, her/his participation will include the following:

(a) Reading ability test (tape-recorded, individually administered)
(b) Oral Reading (tape-recorded, individually administered)
(c) Writing a story

Participation in this study may cause some inconvenience to a child, by the way of the time commitment needed for the testing and performance. In order to minimize children's feeling tired and overwhelmed, the test items will be restricted to the minimal in order to shorten the total time spent for testing. The testing will take place after school in a classroom at School D and will take 30 minutes. I will administrate the test on an individual basis. The door will be kept locked during the testing so that no third person will interrupt. The results

will not be shared with the teachers at School D or used to evaluate your child in any way. Only with your permission, the teachers at School D will be provided with the information from this research. There are no known or anticipated risks to children by participating in this research. Your child may indirectly benefit from the study when the study result is made known to educators. Improved teaching methods are likely to happen which can help many children, including yours.

Your child's participation in this research must be completely voluntary. If she/he does decide to participate, he/she may withdraw at any time without any consequences or any explanation. If she/he does withdraw from the study I will use her/his partial data collected from the performance, only if you agree to this.

In order to assure that your child is continuing to give her/his consent to participate in this research, before testing, I will explain to her/him verbally that (1) her/his name will be changed in my thesis to protect her/his identity, (2) the testing and oral reading will be tape-recorded for the further analysis, (3) the test results will not affect her/him in any case but help the researcher and other children, and (4) she/he can quit anytime if she/he does not feel comfortable.

In terms of protecting your child's anonymity I will not use her/his name in my thesis but I will give a number to your child instead. The principal and teachers at School D will keep all information concerning participating students confidential. A third person will not be able to watch or hear the testing. Your child's confidentiality and the confidentiality of the data will be protected by having data stored in a locked drawer at my home. I will be the only person who will be able to access the information from the drawer. Data from this study (including audiotapes) will be disposed of one year following the completion of the thesis and the publication of the report. The written data will be shredded by myself. The audiotapes will be erased too.

In addition to the use of data to complete my M.A. thesis, I will use the data for publication, presentations at conferences, seminars, and meetings. You will be provided with the information resulting from this study in a form of a summary report. If your child shows any particular characteristics in the previously-mentioned tests (e.g., incorrect intonation or midword pauses in reading, mistakes in writing, or uncertainty over directions, numbers, and orders), I will describe them in the summary report. Prior to the completion of my M.A. thesis, you will have the option to inquire about the test results of your child.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Parent	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

APPENDIX G

Consent Form to the Participants

Dear Student,

My name is Harumi Ototake. I am studying at the University of Victoria, Canada. I would like to come and ask you to have a conversational test, read aloud a sentence, and write a story. By asking you to perform this set of tasks, I will learn more about children of your age who have difficulties in reading. You do not have to do the task(s) that you do not want to. If you have decided that it is okay for you to participate in my study, you can sign your name at the bottom of the page. If you have decided you do not want to participate in my study, you can tell your mom or dad anytime and they can tell me on their form. Thank you for listening to this letter and thinking about letting me learn from you.

Sincerely,

Harumi Ototake

I have listened to the information letter and I give Harumi Ototake permission to give me a reading ability test and performance assessment tasks in oral reading and story writing. I understand that I do not have to do a task(s) that I do not want to, and if I change my mind and do not want to be in her study anymore, I just have to tell her.

_____	_____	_____
Name of Student	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

VITA

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Characteristic Features of Reading Difficulties Among Japanese Children

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Author

Harumi Ototake

August 29, 2003