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Dyslexia in Hong Kong: Perspectives of Definition and Assessment

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This paper looks at the recent history of developmental dyslexia in Hong Kong through the perspectives of local definitions and assessment processes, as concepts and consensus on these evolved over the years. Issues in assessment practices and their implications on the life span of individuals with dyslexia in Hong Kong are discussed.

Key words: dyslexia, Hong Kong, definitions, assessment, life span

Specific learning disabilities (SLD; or learning disabilities [LD] as known in some countries) including dyslexia, has been one of the most misunderstood yet disabling conditions that affects a significant proportion of the population. The field is often beset by disagreements about the definition of this group of disorders on diagnostic criteria,

assessment procedures and intervention measures. This is in no small part due to the legitimate and necessary involvement of professionals from diverse backgrounds addressing this subject, requiring their dialogue and collaboration in service provision, policy setting and research. Differences in professional language and terminology used by respective fields, underlying theoretical models, philosophies and value systems promulgated over years within their discipline are difficult to be reconciled, or indeed understood, from the other side. One could easily appreciate these difficulties when the range of professions within the field of SLD is surveyed: basic neuroscience in the laboratories, neurology and developmental paediatrics in medicine, psychology, speech and language pathology, education, administrators and policy makers, who need to work together in formulating definitions and management that is acceptable to all.

Hong Kong is no exception in its history on dyslexia. Examples of earlier works on Chinese reading from fields of medicine, psychology, linguistics and education (Huang, 1983; Hoosain, 1986; Leong, 1989; Leong, Cheng, & Lam 2000; McBride-Chang & Ho, 2000; Perfetti & Tan 1998; Tzeng, 1994; Tzeng & Wang, 1983) discussed how brain involvement and psychological processes might be different in and specific to reading Chinese orthography as compared with the alphabetic script. The roles of left versus the right brain, script to speech relationships, phonological versus visual perceptual processes, auditory versus visual memory, and perceptual routes recruited for semantic access in morphemic versus alphabetical scripts, etc., were keen areas of academic discourse. In particular, visual perceptual decoding of a logographic script, processed in the right hemisphere and followed with direct semantic access, was often believed to be characteristic of Chinese reading. These issues in turn influenced beliefs on the underlying nature of dyslexia in Chinese, its definitions, and approaches employed to identify and assess individuals with suspected reading disabilities.

The present paper discusses some of the conceptual developments on Chinese dyslexia in Hong Kong, and how consensus in definitions and alignment in assessment practices have evolved to this day.

Evolving Terminology and Definitions

School and social systems largely view children with developmental disabilities according to broad categories: intellectual, physical, sensory and debilitating emotional-behavioural disorders. A collective group of "learning difficulties/disabilities" is often applied to the group of children without explicit impairments, who are yet unable to cope with typical instruction in education, vocational training or employment. Until the mid-1900s "Learning Difficulties" (also referred in an earlier government policy paper on rehabilitation as "Slow Learning" (Health, Welfare & Food Bureau, 1977), was used by the government to refer to students who were generally not coping within educational settings despite apparent absence of significant impairments, until it was deleted from Hong Kong's rehabilitation policy as a category of disability because "pupils with learning difficulties do not typically have an impairment … and are amenable not to rehabilitation services, but to educational services" (Health, Welfare & Food Bureau, 1995).

Meanwhile in the United States, 1990 to 1999 was designated as the "Decade of the Brain", as part of a high level effort by the U.S. President and the Library of Congress and National Institute of Mental Health of the National Institutes of Health, to advance the goals of enhancing public awareness of the benefits to be derived from brain research. This fostered high levels of activity in research on human brain development and function in the U.S. as well as over the world, leading to among many major discoveries, dramatic advances in the appreciation of children's learning and behaviour during that decade. Terms such as "minimal brain damage" without further elaboration were considered no longer adequate for understanding the specific nature of the individual differences. Conditions such as specific oral language impairment, motor coordination disorder and specific reading impairment began to be understood from their biological, neurological and cognitive underpinnings. Many of these were conditions within the heterogeneous group of specific learning disabilities. On dyslexia, insight is gained from molecular studies of genes and their effects on neuronal migration in the fetus, through which differences in brain structures and neurological processes attributable to reading impairment are

appreciated (Galaburda, LoTurco, Ramus, Fitch, & Rosen, 2006). Functional neuroimaging techniques revolutionized research into human brain function without the need for invasive techniques, while producing in vivo observation of brain activities during specified human tasks. Functional neuroimaging findings in normal and abnormal reading provided large amounts of data on how written language is processed in different languages, including more recent studies in Chinese reading (Booth et al., 2006; Siok, Niu, Jin, Perfetti, & Tan, 2008). Cutting edge research on dyslexia stimulated intense excitement not only in those working on these studies, many of which involving multicentre collaborations, but also of clinicians in Hong Kong working with children with dyslexia, who saw new promise for designing corresponding evaluation and intervention measures through reference to evidence based neuroscientific and psychological models.

Traditionally, the term “dyslexia” has been used more often among medical and psychological teams, especially in the early days with reference to adults with acquired brain injury who lose their abilities to read. The term “developmental dyslexia” gained wider recognition in the 20th century when the presence of severe difficulties in children in learning to read despite intact intellect and opportunity to learn, came to the awareness of parents and teachers. This was the case in Hong Kong, when neurologists, paediatricians and educators became alerted to the potential presence of a significant group of children with specific reading problems in the community. Indeed by that time, educators were already aware of these children who exhibit a range of language and perceptual problems despite apparent lack of disabilities, and had tried to help them through individualized support within regular classrooms.

Understanding that SLD represents a group of heterogeneous conditions that frequently co-occur in one child, and in an effort to understand these component conditions, professionals and academics from different fields in Hong Kong, including education, medicine, neuroscience, reading science, rehabilitation and speech and language, gathered in the late 1990s to hold study groups and seminars, speaking on experiences and data from their own fields. Following a conference organized by the Hong Kong Society of Child Neurology and Developmental Paediatrics in 1999 on SLD, staging presentations by a

team of academics and professionals, a monograph was published with a joint position statement on SLD and papers from the conference (Hong Kong Society of Child Neurology and Developmental Paediatrics [HKCNDP], 1999). The joint statement described SLD as "a mixed group of disorders that cover reading, spoken and written languages, mathematics and perceptual motor skills, where these conditions can co-occur with each other, and are inherent in the individual and developmental in nature." It stated that among the different SLD subgroups there are varying degrees of overlap in occurrence and symptoms, with the largest subgroup being developmental dyslexia. Here, dyslexia was presented as a condition where there is below-age reading written language development despite average or above average intelligence and adequate instruction, and severe difficulties in connection between the written word and sounding out at the automatic level. This set the scene in Hong Kong for viewing dyslexia, including in Chinese, as a language based disorder, emphasizing written word decoding and writing as core deficits. Reading comprehension and writing expression were only briefly addressed.

These definitions in Hong Kong occurred at a time when similar consensus was being formed overseas, where in 2003 the working group of the International Dyslexia Association, the National Institute of Child Health and Human Development, National Institutes of Health, U.S. and Yale University School of Medicine, elaborated the components of a working definition of developmental dyslexia (Lyon, 2003; Lyon, Shaywitz, & Shaywitz, 2003): "Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction." This definition draws from the relationship of biological and psychological underpinnings with behaviour, and is in contrast with that of both the International Classification of Diseases (ICD-10) (World Health Organization, 1992) and DSM-IV (American Psychiatric Association, 1994), which apply conceptual and operationalized criteria in their descriptions of reading disability. ICD-10 and DSM-IV describe

the condition as a "specific reading disorder" and "reading disorder" respectively, where low reading achievement is unexpected of measured intelligence and which does not result from sensory, neurological and educational inadequacies. In Hong Kong, researchers began to look at single word decoding and writing errors in literacy evaluation, with phonological and orthographic cognitive processes and naming fluency as supporting features.

To consolidate agreement in local definitions, a forum on SLD was held in 2005 where key-players on the subject from various fields were invited to join in a review of concepts and practices on dyslexia in Hong Kong. By this time, use of the term "dyslexia" was generally accepted across professions. A consensus paper, "Specific Learning Disabilities and Dyslexia in Hong Kong: Position Paper on Future Directions" was produced (HKCNDP, 2006). It provided a more detailed consensus definition on SLD and dyslexia for Hong Kong, where:

> **SLD** is a term that refers to a group of disorders manifested as significant difficulties in the acquisition and use of listening, speaking, reading, writing or mathematical abilities, despite access to conventional teaching. These disorders are intrinsic to the individual and neurobiological in origin, with onset in childhood and extending beyond it. Language processing difficulties distinguish SLD as a group.
>
> SLD is not the direct result of sensory impairment, mental retardation, social and emotional disturbance or environmental influences (e.g., cultural differences or insufficient/inappropriate instruction). Accompanying weaknesses may be identified in areas of speed of processing, working memory, phonological recoding, fine-grained auditory and/or visual processing, sequencing, organization, and motor coordination. Some individuals with SLD have outstanding skills. Some may have skills that are masked by their SLD, while other individuals may have strengths in aspects not affected by their SLD.
>
> **Developmental Dyslexia** is one of the specific learning disabilities, characterized by difficulties with accurate and fluent word recognition, word reading and writing to dictation or spelling. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and further acquisition of

> knowledge through print. Unexpected discrepancy exists between learning aptitude and achievement in school in one or more basic subject areas.
>
> It is acknowledged that SLD may co-occur with other developmental disorders. Attention deficit/hyperactivity disorder (ADHD), with its own different neurological basis, diagnosis and treatment, is not a form of SLD, but may also occur in individuals with SLD. (pp. 2–3)

Much work was done in ensuing years by academics, service providers, policy makers and parents. The number of children with dyslexia identified, diagnosed and supported rose sharply. The peak age of diagnosis fell from late primary grades in the 1990s, to the first two years of primary school. A meeting of multiple stake-holders, including representatives from government and statutory bodies and invited experts from overseas, was held in 2007 at the "Summit on SLD in Hong Kong" (HKCNDP, 2008). Here again, updated definitions and nature of dyslexia, together with stock taking of local developments and future plans for service and research were discussed. Compared with the focus of previous meetings, a wider range of age groups from preschool to adults with dyslexia were represented. In the presentation by Professor Doris Johnson of the Northwestern University, reading process was described as "a hierarchy of language performance involving learners' experience, nonverbal cognitive processes, receptive and expressive language, discourse processing and written language" (Johnson, 2008). This perspective highlights reading at a level above and beyond that of word decoding, alerting practitioners to the need for observing oral language and other cognitive factors in reading performance. Professor Che-Kan Leong from the University of Saskachewan and The Chinese University of Hong Kong, and Professor Man-Koon Ho of The Chinese University of Hong Kong, presented their theory-based assessment of reading and its difficulties in the Chinese language system, within which they not only discussed the importance of specific cognitive factors in early reading at the word level, but also emphasized the importance of lexical knowledge and also the broader aspects of text comprehension and essay writing (Leong & Ho, 2008).

Developments in Assessment

With the above evolutions in the understanding and definitions of reading disorders, how have measures for assessment of dyslexia changed correspondingly? And how have assessments in turn influenced intervention and life opportunities for affected individuals?

Early activities on "learning difficulties" up to the mid and late 1980s were mainly the realm of educators, with therapists occasionally helping children who demonstrated perceptual motor symptoms. Assessment of oral language development was largely limited to preschool children until the launching of a locally developed and normed assessment tool for school aged Cantonese children in Hong Kong by the Department of Health in 2006 — the Hong Kong Cantonese Oral Language Assessment Scale (HKCOLAS) (Department of Health & City University of Hong Kong, 2006), and support for school based speech therapy service to all primary schools was rolled out by the Education Bureau from 2006–2008. Until then, there was relatively little discussion and understanding of specific language impairments in school aged children. A common belief in the 1980s and early 1990s was that learning difficulties, with their unexpected and bizarre reading and writing errors, could be explained by sensory and/or motor perceptual deficits. Practices from overseas, many still under heated professional debate in their own regions, spread to Hong Kong through parents who had the resources and were desperate for a diagnosis and services. Assessments may include those on visual function related to colour or glare problems or to "special refractive deficits", followed by prescriptions of coloured or prism glasses to improve reading; or assessments of balance, motor control and eye movements, followed by medication or physical training to improve reading. Bearing in mind the frequent co-occurrence of dyslexia with other SLD conditions, as well as with other non-SLD conditions such as attention deficit, teasing out presenting symptoms may not be simple. These are further complicated by secondary effects in the child — low motivation, poor subject content knowledge and emotional issues. At this time, the availability of multidisciplinary, cross sector teams in assessment was still limited.

By the 1990s when the language based nature of dyslexia became more widely understood and accepted, effort was made to add on evaluations of underlying linguistic deficits believed to be responsible for the reading problem. Assessments of Chinese children began to include informal assessments of psycholinguistic and cognitive processes, adopted through understandings from alphabetic languages, looking at phonological processes, verbal working memory and verbal fluency. Clinicians also studied the characteristics of single word reading and writing in Chinese children with dyslexia, analysing phonological, orthographic and morphological errors. These clinical observations helped to demonstrate weaknesses in orthographic knowledge as seen by the children's poor awareness of common components and internal organization of characters, and in phonological processes skills with confusions between similar sounding words (made ever more challenging by the numerous homophones and similar sounding words present in Cantonese). Errors due to confusions between semantically similar words are typical and striking to the clinician or teacher, such as the child reading or writing "Christmas" for "presents" — both being related to the Christmas season, but represented not only by a different number of characters, but by vastly different looking and sounding words. Clinicians during that period often had to resort to these types of individualized informal assessments, documenting literacy levels, errors and performance in related psycholinguistic processes.

Although these assessments contributed to deeper understanding of these children's deficits and functioning, they were however inadequate for producing formal diagnostic confirmation of dyslexia that is officially accepted by schools for corresponding service provision. Compounded with rising public awareness and parent demands in the late 1990s, it was clear that a common set of professionally and administratively accepted local tools were needed. In 2000, the Hong Kong Test of Specific learning Difficulties in Reading and Writing (HKT-SpLD) (Ho, Chan, Tsang, & Lee, 2000), normed for early primary grades, was launched. More and more children became identified and "diagnosed" with dyslexia, and thereby eligible for support and accommodations in the education system. Prevalence rates

of specific learning difficulties in reading and writing in Hong Kong was reported as 9.7% to 12.6% with 6.2% to 8.7% mild cases, 2.2% to 2.3% moderate cases and 1.3% to 1.6% severe cases (Chan, Ho, Tsang, Lee, & Chung, 2007).

Over the ensuing decade, tools for identifying and assessing reading and writing problems were continually being developed in Hong Kong by various academic and clinical teams: for screening in primary and secondary grade students by teachers, for diagnostic confirmation in higher primary (Ho, Chan, Chung, Tsang, Lee, & Cheng, 2007) and junior secondary levels (Chung, Ho, Chan, Tsang, & Lee, 2007) by psychologists, and for screening of at risk preschoolers by parents, among others.

Issues in Assessment and their Implications from a Life Span Perspective

During the past decade, assessment of word decoding abilities, documentation of literacy levels and evaluation of cognitive processes believed to underlie reading difficulties have continued to be the cornerstones in diagnostic consideration. Some elements of expressive writing and reading comprehension testing are included for students at higher grades. Diagnostic assessment of reading disorders continues to remain the responsibility of psychologists. Currently, diagnostic confirmation does not include components of general language abilities. It is interesting to note, however, that not only are broader language issues intuitively important as part of the diagnostic workup, they are of particular concern in the context of Hong Kong's oral and written Chinese characteristics. Here, students have to deal with a Cantonese dialect with its own phonological characteristics and vocabulary, many of which do not have corresponding written forms; a written language that applies a different set of vocabulary and grammar mapped from Putonghua; and the use of traditional Chinese characters in daily learning whilst also being exposed to simplified Chinese characters that are being increasingly used in the community. Language issues are further complicated by the need to read and write (and sometimes to learn through English as a medium for instruction), when in fact

effective verbal use of English as a second language is limited for most families and students in Hong Kong.

As can be appreciated, children with oral language issues have their additional and specific issues in reading comprehension and/or written expression. These are beyond what might be detected by current reading assessment batteries. The ability of students with dyslexia to acquire subject content through reading may be affected by a number of factors. By secondary grades, word decoding problems may have improved and are no longer the major reason for poor comprehension. These issues become critical at higher grades, when assessment for deficit-and strength-specific accommodations for learning and examinations are indicated to cope with content learning and examinations. These are of particular significance in preparing and applying for high stakes examinations. For example, to know whether a student with dyslexia will benefit from being read aloud to, or whether he/she could effectively answer orally or apply speech to text software in course work or in examinations, assessment of broader language abilities will be needed. Empirical trying out and documentation of benefit from accommodations may take care of operational needs, but the student's core impairments that need to be addressed or strengthened will not be recognized.

A second issue to consider in assessments is the need to identify strengths and weaknesses in verbal and non-verbal processes for helping students acquire content knowledge. Again, this becomes a pressing need as they proceed to higher grades with extensive amounts of information to capture, organize and reproduce. When the gap in content knowledge is so serious that it renders daily classroom participation ineffectual, learning motivation will naturally be minimized.

A third area of assessment to be considered involves young children at risk for reading disorders. These could include children with preschool oral language problems, or with family history of dyslexia. Early intervention has been extensively shown to be efficacious in maximizing positive effects of remediation while minimizing long term negative effects. Parent education for supporting these children can also be provided in a timely manner. Longitudinal studies are being done in Hong Kong to look at cognitive profiles in typically developing and at

risk Chinese preschoolers, and at early predictors of dyslexia (Lam, McBride-Chang, Lam, Wong, Chow, & Doo, 2008; McBride-Chang, Lam, Lam, Doo, Wong, & Chow 2008). Other longitudinal studies look at connections between specific language impairment and reading disabilities in Cantonese Chinese children as they grow from preschool to school age. Cognitive and clinical characteristics of children whose preschool language impairment persists or who develop reading disorders at school age, are being followed and studied (Wong, Ho, & Au, 2010; Wong, Ho, Au, Kidd, Lam, Yip, & Lam, 2010). With a large population of preschoolers currently being diagnosed with language impairment, those who go on to develop oral or written language problems may hopefully be identified through preschool detection of predictive underlying features, and be given timely attention and support.

A forth area of focus in assessment involve students with dyslexia who are finally making it through the system into Hong Kong's tertiary institutions during these last few years. Tools and measures for Hong Kong's university students and young adults are urgently needed. These are not only necessary for diagnostic confirmation at the time of admission, but for supporting their choice of subjects, planning of accommodations needed by individual students to manage the volume of reading and writing, and arrangements for producing end of course work and sitting examinations.

Finally, assessment of dyslexia in adults for occupational purposes is a matter that Hong Kong will need to face presently. With SLD being admitted as a category of disability in Hong Kong's rehabilitation policy (Hong Kong Programme Plan Review Working Group, 2007, p. 12), vocational training institutions and employers are tasked by law to provide the necessary adaptive skills support and work place accommodations for affected individuals. Indeed, in Hong Kong today, due to poor public awareness and unwillingness of the great majority of affected individuals to disclose their diagnosis, individuals with dyslexia are arguably the most "invisible" group of persons with a disability in the workplace. Yet reading has become an indispensable life skill in today's society, at work or in daily living. Perhaps in the last analysis, a dyslexia-friendly community should be what we are aiming for.

Concluding Remarks

Hong Kong's evolution on the subject of developmental dyslexia shares much common ground with that of other countries, where work on reading disabilities commenced many decades ago. As in those countries, the need in Hong Kong for a common language between the multiple sectors posed serious difficulties for arriving at a consensus definition. Many names and labels have been used over the years to describe this misunderstood and heterogeneous group, making new nosology and nomenclature ever more challenging to introduce. Differences in historical practice, research background, and the threat of work and resource burden for the different parties, render consensus as much a political and cultural compromise as it is a professional alignment. These issues are no doubt further aggravated by everyone's awareness of the high prevalence of a previously "invisible" group, now ready to march in through their doorsteps.

Yet, dyslexia in Hong Kong is uniquely different and fortunate in many aspects of its development. First, with the amount of high quality evidence already accumulated in other countries over preceding decades, Hong Kong was able to save much time and resources by learning from available research and learned scholars, and instead focus on how much of that knowledge is relevant to its own language and script, and what further work is needed. Second, Hong Kong is a small territory where many key players know and interact closely with each other, with rapid transfer of information and possible centralized collaboration of efforts, and certainly, where there is an abundance of pooled tangible resources. Finally, the presence of active and unified advocacy groups, backed by academics, professionals and legislators, provided the momentum for the subject to move forward, quickly and relentlessly.

Against this background, the terms and respective definitions for "specific learning disabilities/difficulties, dyslexia, reading disabilities/reading and writing difficulties" were agreed upon within a relatively short period. Western influence in terminology and definitions had some but limited impact, being a mix of those from the United Kingdom when Hong Kong was its colony, and from North America and Europe through literature, and visiting and returning scholars.

Through the multiple cross sector meetings and forums organized among local stake-holders described earlier in this paper, Hong Kong has, in gist, rapidly determined its own repertoire of dyslexia nosology, concepts and definitions.

On assessment tools and practices, Hong Kong benefited from a shared urgent desire to develop a set of jointly recognized, locally validated and normed screening and assessment tools. Public departments and authorities, related non-government and charity organizations of Hong Kong, provided strong leadership in driving the research agenda through collaborating of efforts and sharing of intellectual resources. The unity of goal and effort is surely one of the few witnessed anywhere today.

Last but not least, Hong Kong has the advantage of solid professional disciplines and specialties: educators, developmental paediatricians and neurologists, clinical and education psychologists, occupational and physiotherapists and speech therapists, all of whom benefit from the presence of robust academic and accreditation programmes in local institutions. Standards of practice by these disciplines are monitored either through statutory registrations such as under Hong Kong's medical ordinances, or through supervision by their respective professional bodies. No doubt, these disciplines are instrumental in ensuring that non-theoretically driven and non-evidence based concepts, definitions and practices concerning dyslexia will not be well tolerated. Furthermore, Hong Kong's government, which determines related policies and funding resources for many parties, have consistently demonstrated strong respect and demand for scientific and high quality tools, professional preparation and service models, giving mandate and energy to good work. All these are critical factors for advancement and success.

Indeed, there is much that Hong Kong has to be thankful for, in reviewing its short history on dyslexia, as seen through issues in definitions and assessment.

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讀寫障礙定義與評估：香港的經驗

藍芷芊

摘要

本文旨在就讀寫障礙的定義和評估程序兩方面，介紹發展性讀寫障礙在香港的歷史，以反映近年本地學者及教育界在這課題上不同的見解及共識。此外，本文亦會探討有關的評估方法及其對讀寫障礙人士在不同人生階段的含義和影響。

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