Psychologists' Learning Disability Assessment Practices and Attitudes Toward Evidence-Based Change in Nova Scotia

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Defense Acceptance Form

Dedication

This work is dedicated to all of the children whom I've had the honour of working with throughout this degree. Their well-being is the big picture, the ultimate goal, and the motivation for every bit of work that has gone into, and will continue to go into, my research.

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Abstract

The purpose of this study was to investigate the actual and preferred psycho-educational assessment methods and attitudes toward evidence-based practices among Nova Scotian psychologists and candidates registered. Forty-seven practitioners completed an online questionnaire with items targeting current and preferred test and procedure use, attitudes toward empirically based practices, satisfaction with assessment techniques, and demographic variables. Results showed that the majority of practitioners have positive attitudes about evidence-based practice and prefer to use tests and procedures supported by a strong research base. However, many are not endorsing research-based methods in actual practice, due to limited resources, training, and support, leading many to feel less satisfied with their current approaches to learning disability assessment. Implications of this study are discussed in terms of affecting evidence-based changes in learning disability assessment at the organizational and provincial levels, and opportunities for future research are discussed.

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Chapter I: Introduction

Accurate learning disability assessment is an important tool for screening at-risk children, determining whether individuals are eligible for special services, and program planning for students who struggle to learn with regular teaching methods alone (Fleisher & Tannenbaum, 1989). Children whose learning disabilities go undiagnosed and untreated are at a higher risk for many serious life problems, including adolescent suicide, running away, and homelessness (Siegel, 2003). Despite the importance of empirically supported learning disability identification, problems with developing a widely used operational definition of learning disabilities and controversy surrounding diagnostic techniques have plagued assessment research and practice for several decades (Proctor & Prevatt, 2003; Thurlow, 1983). In Canada, learning disability assessment is conducted differently from province to province and is inconsistent even within provinces (Kozey & Siegel, 2008; Wiener & Siegel, 1992).

The goal of the current study was to evaluate how learning disabilities are currently being assessed and diagnosed in Nova Scotia. The researcher first identified the current techniques used by these psychologists in learning disability assessment and then evaluated how they would prefer to assess learning disabilities if appropriate resources and support were available. Finally, the researcher measured psychologists' perceptions of, attitudes toward, and exposure to current learning disabilities research.

A description of some of the historic controversies surrounding learning disability (LD) definition and diagnostic techniques follows, as well as a report on the current state of the LD definition in Canada. Subsequently, common aspects of LD assessments, as summarized by Flanagan, Ortiz, Alfonso, and Dynda (2006), will be described. Arguments against the basic

ability-achievement discrepancy model will be given, and evidence for response to intervention (RTI), information processing models (Cattell-Horn-Carroll theory), and eclectic approaches will be discussed. Finally, the rationale, specific research questions, and methodology used for this study will be described in detail.

Defining Learning Disabilities

Historically, there has been a great deal of controversy surrounding the nature of learning disabilities, both with respect to solidifying an LD definition and implementing best practices in LD assessment and diagnosis. Due in large part to this controversy, the LD definition has changed over time, with revamped definitions being proposed by different researchers every few years since the early 1960s (Kavale & Forness, 2000). The first formal definition of LD was developed by Kirk in 1962:

> A learning disability refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural and instructional factors (as cited in Kavale & Forness, 2000, p. 241).

Since this original LD definition was drafted, elements of the definition have been eliminated or modified, while new elements have been added (see Kavale and Forness, 2000 for a detailed description of how LD definitions have changed over time). The official definition of learning disabilities supported by the Learning Disabilities Association of Canada since 2002 can be found in Appendix A. A notable addition to the popular definition of LD includes the presence of one or more processing deficit(s). Another change to the LD definition is the inclusion of "difficulties with organizational skills, social perception, social interaction and

perspective taking," although disabilities of oral language, reading, written language, and mathematics continue to be highlighted. In addition, the terms "lifelong," "genetic," "neurobiological," and the phrase "affecting all areas of life, not just education" have all been added to the Learning Disabilities Association of Canada's Official Learning Disabilities Definition since the previous version (Learning Disabilities Association of Canada, 2002a.)

Operational Definitions of Learning Disabilities

In order for a definition to be useful for research purposes, it must first be operationalized. An operational definition is "a definition of a concept or variable in terms of precisely described operations, measures, or procedures" (Goodwin, 2003, p. 520), the purpose of which is to create an objective, replicable study. An operational definition of learning disabilities is one that consists of clearly stated operations and guidelines that must be followed in order to determine whether or not a learning disability is present (Kavale & Forness, 2000).

Perhaps even more controversial than the general definition of learning disabilities is the way in which that definition is operationalized for research and practice (Gallego, Durán, & Reyes, 2006). At one end of the operational spectrum are the researchers and practitioners who operationally define learning disabilities as an objectively measured difference between achievement and potential (as measured by an IQ test) (Kavale, Holdnack, & Mostert, 2006). At the other extreme are those who do not believe that intelligence testing is at all useful in the determination of learning disabilities (Siegel, 1989a, 1989b, 1992, 2003; Siegel & Himel, 1998; Stanovich, 1999, 2005; Warner, Dede, Garvan, & Conway, 2002). Still other learning disabilities experts fall somewhere in the middle, accepting intelligence-achievement discrepancy as a necessary, but insufficient, part of LD diagnosis (Harrison, 2005).

Despite a proliferation of research over the past several decades in the area of learning disabilities, the techniques used for identifying and diagnosing LD in North America have

changed very little over the past 30 years (Gallego et al., 2006). Since the 1960s, most practitioners the United States and Canada have relied heavily on IQ-achievement discrepancy criterion for LD diagnosis (Gallego et al.), and most state policies continue to specify the use of discrepancy methods (Warner et al., 2002). While learning disability diagnosis is inconsistent among Canadian provinces (Wiener & Siegel, 1992), most provincial policies either list discrepancy as required for LD diagnosis (Ontario) or list discrepancy as an important part of the learning disabilities definition (Kozey & Siegel, 2008; Harrison, 2005). A "wait to fail" approach is also common, with some provinces, including Nova Scotia, requiring children to have fallen a specified number of grade levels behind before they are eligible for severe learning disabilities (SLD) support programs (Kozey & Siegel). One change that has been made in Canadian policy over the years is the discontinuation of the exact IQ-achievement discrepancy requirements that used to be specified by each province. According to Kozey and Siegel, this move away from specifically stated IQ-achievement magnitudes "suggests that Canadian policy is shifting away from an IQ-achievement model of LD, yet it remains reliant on it in absence of a clearly established alternative definition or approach" (p. 169). Nova Scotia is the only province to document responsiveness to formally intervention (RTI) as a possible alternative to discrepancy models for identifying LD; however, being three grade levels behind is still required for access to SLD programs for Nova Scotian students, and RTI is not common practice (Kozey & Siegel).

Outside of North America, use of simple discrepancy methods in exclusion of other methods for LD diagnosis is less common (Klassen, Neufeld, & Munro, 2005; Woods & Farrell, 2006). Woods and Farrell studied the assessment practices of educational psychologists in England and Wales who worked with children with behavioural and/or learning difficulties. Their survey included questions regarding psychologists' use of and satisfaction with a variety of

learning and behavioural assessment methods. While it was found that 71% of psychologists used either partial or full cognitive assessment batteries (or a mixture of the two) on a regular basis (in at least 25% of casework) when working with children suspected of having specific learning difficulties, cognitive tests were not ranked among the top three most commonly used assessment methods, and only 8.5% of psychologists ranked the employment of full psychometric cognitive batteries as one of the three most useful assessment methods (Woods & Farrell, pp. 394-395). Instead, the top three most commonly used assessment methods for learning difficulties in England and Wales included an "individual interview with child" (97% of educational psychologists used this method regularly), an "interview with school staff" (95%), and an "interview with parents" (91%) (p. 394). The three assessment methods ranked as most useful by the educational psychologists included an "interview with child" (63%), "facilitating or problem solving process involving teachers, parents/other professionals" (41%), and an "interview with school staff" and "observation of child in playground" (both ranked as most useful methods by 38% of psychologists) (p. 394). Use of a psychometric cognitive battery in its entirety was ranked 11th most commonly used assessment method and was tied for 8th place in the most useful assessment methods category (p. 394). Use of a partial psychometric cognitive battery was ranked 10th most commonly used assessment method and was tied for 12th place in the most useful methods category (p. 394). While educational psychologists in England and Wales do continue to use cognitive tests as a part of the learning difficulties assessment, these tests are rarely used in isolation and do not appear to be sufficient for a diagnosis of specific learning difficulty. Psychologists' commentaries in the Woods and Farrell study noted satisfaction with psychological assessment "not being dominated by cognitive assessment" (p. 399). Conversely, however, it was noted by one educational psychologist that there is a looming dissatisfaction with the "stranglehold" of cognitive assessment (p. 399).

In Western Australia, Klassen and colleagues (2005) used questionnaires and focus groups to study the learning disability-related beliefs and practices of school psychologists in the area. The study was conducted on the premise that, contrary to North American practices, learning disabilities are not typically defined by discrepancy methods in Western Australia (Klassen et al.). Across Australia, education departments do not include IQ in formal operational definitions of specific learning difficulties (SpLDs), and SpLDs are not considered disabilities (p. 300). Results of the Klassen et al. study indicated that, on average, school psychologists in Western Australia spent one quarter of their time (25%) engaged in psychometric assessment work, with most psychologists spending less than a quarter of their time on these types of activities. Psychologists reported spending about 26% of their time on counselling tasks and over 31% of their time working in collaboration with teachers, parents, and outside agencies. These results reveal that Western Australian school psychologists spend less time engaged in assessment-related activities and more time in consulting and counselling roles than North American school psychologists have reported spending. An unexpected finding in the Klassen et al. study revealed that over 80% of participants ranked the use of IQ test in SpLD assessment as important. However, contrary to the case in most North American jurisdictions, IQ-achievement discrepancy was found not to be the goal of IQ test use. Instead, psychologists reported that the tests were useful for getting to know more about children's general learning abilities and to assess for a global delay when relevant. One school psychologist noted using IQ tests "in a rather benign way..." (p. 308), and using the tests for establishing discrepancies between IQ and achievement was not generally supported by school psychologists in Western Australia.

Alongside discrepancy-based learning disability identification techniques are a handful of other assessment practices, some developed more recently as a reaction to a proliferation of research revealing significant weaknesses with the severe discrepancy approach. Flanagan,

Oritz, Alfonso, and Dynda (2006) arranged a list of components commonly used to define and diagnose LD. These components are listed below, with a brief description of each (pp. 808-811):

1. *History of Academic Difficulties*
    - Older child, adolescent, or adult has shown a history of learning problems, unless recent learning problems are associated with recent trauma.
2. *Use of Prereferral Intervention*
    - Conducting some intervention prior to referral can allow school staff to rule out some external factors that would nullify an LD diagnosis, such as a lack of adequate instruction.

        Flanagan and colleagues stated that the Response to Intervention (RTI) model "provides a rigorous and systematic approach" to prereferral intervention that "complements norm-referenced ability testing in the LD identification process" (p. 811).
3. *An Identified Academic Deficit*
    - Individual shows some learning difficulties in one or more academic areas.
4. *An Identified Cognitive Ability/Processing Deficit*
    - Individual has a deficit in one or more cognitive abilities or processes that have been scientifically linked to the area of the academic deficit. "...both cognitive abilities and processes can be defined within the context of a well-validated, comprehensive, and modern theory of the structure of cognitive abilities [e.g., Cattell-Horn-Carroll (CHC)

theory]" (p.809). For example, phonological awareness is one CHC ability that has been shown to be consistently and strongly related to achievement in reading.

5. *Intact Cognitive Abilities/Processes Not Related to the Academic Deficit*
    - While the individual possesses some cognitive ability or processing deficits in areas strongly related to the academic deficit, he or she does not possess deficits in all areas of cognitive functioning or in those areas not strongly related to the deficit.
6. *Underachievement*
    - Underachievement has most commonly been determined by practitioners following a discrepancy model, whereby IQ scores, supposedly measuring an individual's achievement "potential," are compared with achievement test scores. A discrepancy is found when an individual scores significantly higher on the IQ test than on one or more tests of achievement.
7. *Evaluation of Exclusionary Factors*
    - Other factors that would preclude an LD diagnosis are discovered or ruled out, including such factors as "cultural differences, linguistic differences...economic disadvantage, emotional or psychological disturbances, lack of motivation, fatigue, poor or ineffective instruction, and so forth" (p. 811).
8. *Evidence of Functional Impairment*
    - One or more areas of daily life, such as learning, are negatively impacted by the deficit.

IQ-Achievement Discrepancy

In North America, a simple discrepancy model is most commonly used to identify and diagnose learning disabilities (Gallego et al., 2006). Practitioners using this method rely primarily on IQ and achievement tests. When an individual's IQ is found to be significantly higher than his or her achievement in an area of academic difficulty, there is said to be a "discrepancy" between his or her academic potential and actual achievement (Flanagan et al., 2006). Often, this discrepancy is the only criterion required by many practitioners and school boards in order to diagnose learning disabilities and to allow struggling learners access to special LD resource supports and services (Jiménez, Siegel, Shanahan, & Ford, 2009).

There are several glaring problems with this model of LD identification, and it has been opposed by a number of well-known researchers in the field of learning disabilities (D'Angiulli & Siegel, 2003; Flanagan et al., 2006; Fletcher et al., 1994; Hettleman, 2003; Jiménez et al., 2009; Siegel, 1992; Siegel & Himel, 1998; Stanovich, 1999, 2005; Vellutino, Scanlon, & Lyon, 2000; Warner et al., 2002). The following paragraphs describe these major problems with the discrepancy method of LD assessment (see paragraphs for appropriate citations):

- Discrepancy does not reliably differentiate between poor and good readers.
- Discrepancy does not reliably differentiate between those who are good or poor in mathematics.
- Beyond IQ score, there are no significant differences between poor readers who meet discrepancy criteria and those who do not.
- IQ scores are impacted by learning disabilities ("Matthew Effects").
- Discrepancy model discriminates against African Americans and other non-White cultural groups, as well as against older children/adolescents and those from families with low socioeconomic status.

- Discrepancy model encourages a "wait to fail" attitude, delaying special services with children who may have learning disabilities.
- There are other assessment methods available that have more empirical support and do not rely on an IQ-achievement discrepancy.

A common criticism of the IQ-achievement discrepancy model is that it does not reliably distinguish between poor and normal readers (Vellutino et al., 2000). Vellutino and colleagues (2000) conducted a study that evaluated the efficacy of using intensive early intervention to diagnose reading disabilities in children at the beginning their kindergarten year. An IQ test was administered as part of this study in order to determine whether an IQ-achievement discrepancy reliably determined which children had reading disabilities and which would experience easy reading remediation. The researchers concluded that IQ-achievement discrepancy did not reliably distinguish between normal and poor readers. Nor did the discrepancy criterion predict how children would respond to remediation. Similarly, Jiménez and colleagues (2009) found that IQ scores were not related to any differences found between normally achieving Spanish readers and Spanish children with reading disabilities, as defined by performance on standardized reading tests.

IQ scores have also been shown to be unreliable predictors of arithmetic disabilities (D'Angiulli & Siegel, 2003). D'Angiulli and Siegel compared groups of typically achieving children with children who had learning disabilities in the areas of reading or arithmetic and found that over 65% of children with LD did not show predicted discrepancy patterns between Verbal and Performance IQ scores. Similarly, many *typically achieving* children did show significant discrepancies between Verbal and Performance IQ. The researchers concluded that intelligence test scores are not reliable predictors of learning problems and should not be used for the diagnosis of LD.

A second criticism of the discrepancy criteria is that there are no significant differences apparent between poor readers who meet discrepancy definitions of LD and those who do not (Fletcher et al., 1994; Siegel, 1992; Stuebing et al., 2002). Stuebing and colleagues conducted a meta-analysis of 46 studies comparing groups of students that had been classified as IQ-discrepant or non-IQ-discrepant. They found that across studies, the two groups were not significantly different with respect to areas known to be related to reading (e.g., phonological awareness, rapid number reading). Instead, the two groups only differed significantly with regard to external cognitive variables that were strongly linked to IQ but not to reading. Similarly, Siegel found that poor readers with or without a discrepancy-based dyslexia diagnosis did not differ with respect to scores on word reading, pseudoword reading, reading comprehension, or phonological processing. Both groups of poor readers had significantly lower scores in all reading-related areas than did children from a normally achieving control group. Finally, Fletcher and colleagues also found small or insignificant differences between children with impaired reading who met or who did not meet IQ-based discrepancy definitions of a specific reading disability. These findings indicate that discrepancy definitions of learning disabilities are not useful in determining the specific language-based difficulties of children with learning disabilities in reading.

A third criticism of discrepancy-based LD diagnosis is that IQ scores themselves are impacted by children's learning disabilities, a phenomenon that has come to be referred to in LD literature as "Matthew effects" (Siegel, 1989b; 2009). According to Siegel (1989b, 2009), as poor readers advance year to year in school, they are less likely than their normally achieving peers to seek out printed information, to read for pleasure, or to understand concepts in writing. Therefore, over time, their verbal IQ scores begin to diminish due to a lack of exposure to verbal information. With lowered IQ scores, these older children become less likely to receive or

maintain an LD discrepancy diagnosis and are more likely to struggle without LD support in school. At the same time, reading becomes more and more important in all aspects of learning as children approach the later grade levels. Thus, older children with reading deficiencies often struggle even more as they face the many everyday consequences of poor reading skills, while simultaneously losing or failing to receive resource support.

A fourth and particularly serious claim against the discrepancy model is that it discriminates against people with African American/Canadian heritage and other non-White cultural groups (Warner et al., 2002), as well as against older children and adolescents (Siegel, 1992; Siegel & Himel, 1998) and those with low socio-economic status (Hettleman, 2003; Siegel & Himel). Age-based discrimination of the discrepancy model has been partially addressed in the previous paragraph. As children with learning disabilities age and distance themselves from their areas of weakness, most often by avoiding printed and/or verbal information, their scores on IQ tests begin to drop, due to a strong relationship between verbal IQ and reading scores (Siegel). As these IQ scores drop over time, older children and adolescents often lose whatever IQ-achievement discrepancy may have previously existed, thus creating the illusion that a learning disability no longer exists (Siegel & Himel). In this case, the same children who were previously diagnosed with learning disabilities and provided with specific learning disability support often lose that support along with the diagnosis, simply because their IQ scores have fallen over time as a direct result of their learning disabilities.

African American children are overrepresented in all special needs groups except for learning disabilities, in which they are unfairly underrepresented (Warner et al., 2002). Learning disabilities in this cultural group and in other non-White ethnic groups regularly go undetected and undiagnosed (Warner et al.). Children whose parents are of lower socioeconomic status (SES) also struggle with this underdiagnosis of LD (Hettleman, 2003; Siegel & Himel, 1998).

When the discrepancy method is being used, higher IQ scores increase the chances of an LD diagnosis, while lower IQ scores decrease the chance that a diagnosis will be given. On average, non-White children and those who come from families with lower SES have historically scored lower on IQ tests than White children from families of average or higher economic status (Hettleman). This difference is likely due to biased test construction, as most common IQ tests have been tested and normed on largely middle class, European American samples (Warner et al.). With lower IQ scores and fewer LD diagnoses, struggling learners from non-White, low SES backgrounds are regularly not afforded the same educational supports received by White, middle class children. Through this biased testing, these children are discriminated against throughout their academic careers and are set up for failure (Hettleman; Warner et al.)

A fifth criticism of the discrepancy model, alluded to above, is that it creates a "wait to fail" approach, whereby children who do not yet meet discrepancy criteria are forced to wait for special services until their achievement scores drop low enough to ensure IQ-achievement discrepancy (Fletcher, Coulter, Reschly, & Vaughn, 2004). So while older children are at risk of losing an LD diagnosis with a drop in IQ scores, younger children are at risk of not getting a diagnosis due to not yet falling far enough behind their peers. While children wait for diagnoses and services, they continue to fall further behind in school and are less likely to ever catch up to their same-aged peers or to achieve their academic goals (Fletcher et al.)

The sixth and final criticism of the discrepancy model that will be addressed in this thesis is that, with all of its problems, it is simply not necessary for learning disability diagnosis or as part of the LD definition. There are several alternatives to the discrepancy method, some of which have a great deal of empirical support from many well-respected researchers in the LD field. For instance, Fletcher and colleagues (1994) found measures of phonological indicators to be strong and reliable predictors of reading difficulties, and Vellutino et al. (2000) found

language-based measures to be strongly indicative of reading disability status. The rest of this literature review will describe key alternative methods of learning disability diagnosis. With regard to the fault-riddled discrepancy analysis, Keith Stanovich (2005) boldly stated the following:

> The persistence of the discrepancy concept in LD signals that the field is not ready to put itself on a scientific footing and that it will continue to operate on the borders of pseudoscience. It is ironic that my other research area is critical thinking, particularly the cognitive processes that lead to pseudoscientific thinking.... The fixation on discrepancy measurement provides a test case of things that I study in that area: confirmation bias... and failure to consider alternative theories (p. 103).

Response to Intervention

Response to intervention (RTI) is an early intervention-based approach to the identification of students with learning problems (National Joint Committee on Learning Disabilities (NJCLD), 2005). The primary assumption upon which RTI is based is that students without learning disabilities will make good progress with quality, research-based instruction and remediation (NJCLD). According to the NJCLD, education boards using this model should provide evidence-based instruction to all students and evidence-based remedial instruction to those students who do not achieve at a level equal to same-aged peers. Response to intervention techniques are formally divided into three tiers. The following descriptions of these tiers are adapted from NJCLD (pp. 3-4):

- Tier 1- High quality, evidence-based instruction is provided to all students. Teaching methods are supported by research and students are routinely monitored to quickly identify struggling students.

- Tier 2- Students who are not progressing at the same rate as their peers receive additional specialized instruction within a general education setting. The remedial techniques should be research-based and intense enough to affect positive change in most struggling learners. Parents should be involved in the planning of Tier 2 instruction, as should regular classroom teachers. Students in this tier should be closely monitored for progress to determine whether improvement is occurring and to ascertain if modifications to the instruction plan are warranted.
- Tier 3- Students who do not make satisfactory progress in Tier 2 are referred for a comprehensive evaluation to determine eligibility for services beyond those provided in a general education setting. Parental consent is necessary for a multidisciplinary evaluation to take place. Assessment may include teacher, parent, and child interviews, classroom and playground observations, the use of standardized tests, and a thorough review of all data collected from Tiers 1 and 2.

There are several notable benefits of the RTI approach to LD identification (Flanagan et al., 2006; Fletcher, Coulter, Reschly, & Vaughn, 2004; Vellutino, Scanlon, Small, & Fanuele, 2006). First, with responsiveness to intervention, all children are screened for early reading difficulties, just as they are routinely screened for hearing and vision problems (Fletcher et al.). Reading is crucial to success in most academic areas and should be screened for early. Second, with RTI, the focus changes from eligibility requirements and diagnosis to intervention and teaching (Fletcher et al.). When eligibility is required for a special needs service outside of school, entitlement is attained through a vigorous and systematic learning process—a much more attractive option than waiting for a student to fail. A third benefit of RTI is that it helps to evaluate exclusionary factors when other assessment methods are in place (Flanagan et al.,

2006). If RTI procedures have been in place prior to a psycho-educational assessment, inadequate instruction should not be an issue. Furthermore, since students will have met on a regular basis with RTI-trained resource staff, this method can also help to rule out a debilitating lack of motivation, language barriers, or other external factors that may be impacting achievement (Flanagan et al.). Finally, evidence shows that early, RTI-based intervention in the earliest grades prevents reading difficulties for most at-risk children (Vellutino et al., 2006).

Vellutino and colleagues identified children who were at-risk for reading difficulties upon entrance to kindergarten and provided half of those students with small-group intervention two to three days per week. Other at-risk children received whatever resource was normally provided for children in their schools. Any children in the experimental group who were continuing to struggle in the beginning of first grade received one-on-one intervention. Those who continued to struggle in the control group continued to receive regular school resource into first grade. Student progress was monitored until the end of grade three, and results supported the assertion that kindergarten identification combined with kindergarten and first grade intervention of at-risk students can prevent lasting reading difficulties in most students.

One limitation noted by proponents of RTI is that in order for it to be implemented correctly, professionals will need to be prepared to adequately administer research-based instruction, screening, and remediation—a task that is bound to present many challenges (Fletcher et al., 2004). Opponents of RTI state that the approach has several other limitations as well (Kavale et al., 2006). Kavale and colleagues claim that RTI research has focused exclusively on reading disabilities, thus limiting the scope of the identification method and making it useless for other types of learning disabilities. The same researchers claim that RTI proponents are too vague about what constitutes a successful response to intervention and that, without additional assessment, diagnosis based on RTI methods represents a single criterion

(non-response), which is useful but not sufficient for LD identification. Another criticism posed by Kavale and colleagues is that intervention options for RTI practitioners are limited, due to a lack of research knowledge of teaching techniques beyond those used for word reading difficulties. Finally, Kavale and colleagues claim that proponents of the RTI approach are attempting to drastically overhaul the definition and meaning of learning disability, which should not be done without much more research and a better alternative than present-day methods. Although these criticisms prevent some researchers from supporting RTI as a diagnostic approach *in isolation*, RTI has a great deal of support as a part of a thorough psycho-educational evaluation of learning problems. While RTI may well be an insufficient diagnostic tool on its own, it is a useful component of a comprehensive LD assessment (National Joint Committee on Learning Disabilities, 2005).

Information Processing

The information processing approach to LD assessment makes use of research-based links between known cognitive processes and areas of academic achievement to determine whether or not a disability exists (Fiorello & Primerano, 2005). Over the past two decades, a great deal of evidence has emerged supporting strong associations between specific cognitive processes and academic strengths and weaknesses. One of the most heavily researched information processing areas is phonological awareness, which is known to be a robust indicator of reading ability (Fletcher et al., 1994).

Bell, McCallum, and Cox (2003) studied reading achievement and cognitive abilities in a sample of elementary and middle school students. Their results supported measures of phonological processing in the assessment of reading abilities. Three factors, including auditory processing (including phonological awareness), visual processing/speed, and memory, were found to be critical components of the reading process.

Watson and Willows (1995) studied the information processing abilities of successful and unsuccessful elementary-aged readers and discovered three potential subtypes of poor readers. The first subtype consisted of mildly deficient readers with a single deficit in processing and remembering symbolic stimuli. "These students have trouble with the formation, storage, and/or retrieval of coded information" (p. 228). The second subtype consisted of moderately deficient readers who had worse symbolic processing/memory performance than the readers in Subtype 1, as well as a deficit in visual processing. The third and most severe reading deficiency subtype included those poor readers with deficits in symbolic processing/memory and visual processing, more severe than those deficits in Subtypes 1 and 2, as well as an additional rapid naming deficit. The Watson and Willows study lends support to an information processing approach to reading disability diagnosis, whereby more severe reading deficiencies are found in those people with more severe and numerous cognitive deficits.

The most well-researched and extensively developed cognitive theory is the Cattell-Horn-Carroll (CHC) theory of cognitive abilities (Fiorello & Primerano, 2005). The history leading up to this impressive theory is summarized by McGrew (2004) and partially reiterated here. In the early 1900s, Spearman developed a "two-factor theory" of human abilities, including a general intelligence factor (g) and specific factors (s) (Spearman, as cited in McGrew, 2004, section A). Spearman is credited with being the first researcher to apply factor analysis to the study of human abilities (McGrew, section A). Following Spearman's contribution, British researchers suggested hierarchical models of intelligence, placing most emphasis on the importance of general intelligence (g) (Gustafsson, as cited in McGrew, section A). In the 1930s and 1940s, prominent North American researchers became involved in the area, with Thurstone proposing that 7-9 "primary mental abilities" existed independently of g (Thurstone, as cited in McGrew, section A). Shortly thereafter, Cattell and Horn (as cited in McGrew, section A) founded Cattell-

Horn *Gf-Gc* theory, based on the replicable factors of fluid intelligence (*Gf*) and crystallized intelligence (*Gc*), which they had extracted from first-order human abilities with factor analysis. The Cattell-Horn theory expanded throughout the 20th century to include more common, replicable factors, and the ever-present gap between cognitive theory and practice was first bridged by the development of the Woodcock Johnson—Revised assessment battery in 1989, which included tools inspired by *Gf-Gc* theory (McGrew, sections B & C).

In 1993, Carroll proposed a "three-stratum model" of narrow, broad, and general abilities, providing "the most comprehensive, empirically based synthesis of the extant factor analytic research on the structure of human cognitive abilities" (McGrew, 2004, section D). Although mostly similar to Cattell-Horn theory, the three-stratum model differed due to its inclusion of a g-factor (section D). The "Cattell-Horn-Carroll" (CHC) terminology was informally agreed to by Horn and Carroll in 1999 (section E), and since that time, several new CHC-based assessment batteries and cross-battery approaches have been developed, further bridging the potential gap between cognitive research and practice (section F). According to McGrew and Woodcock (as cited in McGrew, 2003, section 2), "CHC taxonomy is the most comprehensive and empirically supported framework available for understanding the structure of human cognitive abilities". Although well developed, the CHC approach is not complete; nor is set in stone. On the contrary, the founding researchers of this theory have admitted it is not comprehensive and have left it open for empirically established improvements. Thanks to this flexibility, contemporary researchers have refined and extended the CHC model and will continue to contribute to the theory over time, as cognitive research continues to advance.

The following excerpt from Fiorello and Primerano (2005) describes aspects of the current CHC framework that are particularly relevant to cognitive assessment and diagnosis (p.525):

> Within the CHC conceptual framework, cognitive functioning (*g*) is subdivided into specific broad and narrow abilities. Some of the main broad abilities (also referred to as stratum II abilities) include fluid intelligence or novel reasoning (Gf), crystallized intelligence or acquired knowledge (Gc), visual processing (Gv), auditory processing (Ga), short-term memory (Gsm), long-term retrieval (Glr), and processing speed (Gs). Each of the broad abilities is likewise subdivided into narrow abilities. For example, Ga includes the narrow ability of phonetic coding (PC), which describes the ability to process, analyze, and synthesize speech sounds within words.

Specific CHC constructs have been found to be critical components of literacy acquisition, the writing process, and mathematics (Fiorello & Primerano, 2005). Several researchers have created models of learning disability assessment that rely on analyzing consistencies between CHC-based cognitive processes and academic achievement (Fiorellow & Primerano). See the Fiorello and Primerano article for more specific information about CHC as it relates to cognitive assessment and learning disabilities. McGrew's most recent working draft describing the CHC broad and narrow abilities (2009) can be found in Appendix B.

While there is much support for the contribution of information processing models to learning disability assessment and diagnosis, there is also some concern. Dean and Burns (2002) stated that processing models require more time and research before they can be appropriately utilized in assessment practices. For now, Dean and Burns believe that this type of assessment is being inconsistently applied, much like the discrepancy method has been and continues to be. They also blame the sudden popularity of the cognitive processing approach on widespread dissatisfaction with the discrepancy model (p. 174):

> The consensus discredit of the discrepancy model has resulted in a transition from the predominant model in such a rapid manner that acceptance of alternatives may be hasty.

> A great deal of research on processing needs to be examined, replicated, and evaluated under the specific question of appropriateness for a definition of LD.

To the model's credit, Dean and Burns do note that the information processing model does not delay access to student support services in the same way the discrepancy model does.

Alternative and Mixed Models

Although the Official Definition of Learning Disabilities supported by the Learning Disabilities Association of Canada allows for an approach to LD assessment that draws from a wide range of techniques (Learning Disabilities Association of Canada, 2002a), most practitioners in North America do not make use of eclectic assessment methods (Gallego et al., 2006). While some practitioners embrace RTI or information processing models, the great majority continue to use the discrepancy model (Gallego et al.).

However, many research/practitioners have developed assessment practices that draw from a number of different areas. In a 1999 article, Siegel described the components that she deems necessary for a thorough LD assessment. According to Siegel, comprehensive achievement tests should be given in the areas of word reading, pseudoword reading, reading comprehension, spelling, math computation, math problem solving, and writing (p.307). In addition, a writing sample should be analyzed for handwriting quality, word fluency, organization, and types of errors (e.g., phonological or close visual representations in misspelled words)(p. 308), and the client/student should be interviewed to gain additional information about a student's strengths and learning needs. Exclusionary factors should also be ruled out.

Flanagan and colleagues (2006) have outlined an intriguing four-tiered operational definition of LD, which draws from several of the previously mentioned evidence-based assessment practices. The four tiers of this LD definition are listed and described below (pp.

817-824):

Level I-A: Measurement of Specific Academic Skills and Acquired Knowledge

- As a first step in the LD assessment, it must be determined that an achievement deficit exists. Areas that may be deficient may include math calculation, math reasoning, basic reading, reading comprehension, reading fluency, written expression, general information, oral expression, lexical knowledge, or listening comprehension. A combination of RTI methods and norm-reference tests may be included at this basic level of assessment (p. 818).

Level I-B: Evaluation of Exclusionary Factors

- If the first criterion (I-A) is met, the second step in LD assessment should be to rule out any external factors that are the *primary* cause of achievement difficulties. These external factors may include sensory impairment, global cognitive delay, cultural differences, a first language other than English, insufficient instruction (can be ruled out through RTI methods), lack of motivation, emotional disturbance, psychiatric conditions, emotional state during testing, or physical health factors (p. 816). It should be noted that the presence of one or some of these external factors may not rule out a learning disability. They must simply not be the primary cause of achievement difficulties.

Level II-A: Measurement of Specific Broad Abilities/Processes and Aptitudes for Learning

- At the second level, cognitive processes are assessed. Flanagan et al. specifically investigate the CHC broad abilities, including cognitive skills like attention, memory, thinking abilities, and language abilities (p. 816). This step in the assessment process differs from Level I-A by focusing more on cognitive processing and less on acquired skills (p. 820). While learning disabled individuals may struggle with some of the cognitive processes that are highly related to the area of academic dysfunction, most scores obtained in Level II-A should be within the normal range (Flanagan and colleagues specified standard scores of 85-115 as the normal range). In addition, an information processing deficit in the area of academic difficulty should be found. If all or most cognitive processing scores are low, including those not related to academic deficit, a learning disability diagnosis would likely not be given.

Level II-B: Re-evaluation of Exclusionary Factors

- Exclusionary factors, particularly those that might impact testing (like lack of motivation), should be re-evaluated to ensure that the cognitive assessment was valid (p. 820).

Level III: Evaluation of Underachievement

- According to Flanagan and colleagues, "Level III involves evaluation of all data to verify (a) that the student possesses specific and related academic and cognitive deficits and (b) that these deficits... exist within an otherwise normal ability/processing profile" (p. 821). Global

ability scores are not required for this analysis. Instead, processing-achievement *consistency* analysis should be performed to ensure that academic and cognitive deficits are related and that cognitive areas outside of the academic deficit area are otherwise normal or better. If all or most academic and cognitive processing scores are low, assessment may point toward a mild cognitive delay and not LD (p. 821). **(Author note: There are many perspectives on learning disability assessment, and this is but one of them. Many practitioners may not appreciate the consistency analysis due to its similarity to discrepancy. One also has to ask the question, "how low is too low?" in the event that a child is generally low across the board but has an acute deficit in certain, correlated cognitive and academic areas.)**

Level IV: Evaluation of Interference with Functioning

- Once an LD assessment has passed all previous levels, it is important to ensure that the academic and cognitive difficulties are interfering with school performance or other areas of daily functioning. By this LD definition, an individual who is meeting all classroom expectations and not struggling in other areas of his or her life would not receive an LD diagnosis.

Purpose of the Current Study

The purpose of the current study was to examine the current and preferred psycho-educational assessment practices of psychologists (both Registered Psychologists and those on the Candidate Register list) in Nova Scotia, with a specific emphasis on learning disability

assessment. In addition to learning about what procedures these practitioners are currently using for cognitive assessment, their satisfaction with current approaches and attitudes toward adopting newer, empirically supported techniques were investigated. The researcher believes that the current study fills a gap in learning disability assessment research by focusing on a Nova Scotian population and by measuring not only current practices but also psychologists' attitudes toward the implementation of research-based methods in their assessment practices.

Research Questions

Research Question One: What psycho-educational assessment approaches are Nova Scotian psychologists/candidates registered currently using with respect to learning disabilities?

Research Question Two: What psycho-educational assessment approaches would Nova Scotian psychologists/candidates registered prefer to use if given the freedom and resources to choose?

Research Question Three: Where are Nova Scotian psychologists/candidates registered turning for information on current psycho-educational assessment practices?

Research Question Four: How open are Nova Scotian psychologists/candidates registered to implementing newer, empirically supported approaches to psycho-educational assessment?

Research Question Five: What are Nova Scotian psychologists'/candidates' registered attitudes regarding research-based practice, the discrepancy model, and response to intervention (RTI)?

Chapter II: Method

Participants

Participants were recruited through their publicly available email accounts, listed by the Nova Scotia Board of Examiners in Psychology (NSBEP), with the cooperation of the Association of Psychologists of Nova Scotia (APNS). Although 50 online surveys were recorded, three were deleted due to incomplete data (only one or two questions filled out). Thus, the final group of participants included 47 registered psychologists and candidates registered from across Nova Scotia. Of those participants, four were male, 37 were female, and six did not indicate sex. Forty-four point seven percent of participants were between 25 and 34 years old, 19.1% were between 35 and 44 years old, 21.3% were between 45 and 54 years old, and 4.3% were between 55 and 64 years old (see Table 1). No participants reported being under 25 years old or 65 years old or over. Forty-eight point nine percent of participants worked in the Halifax Regional Municipality, 12.8 percent in the Cumberland, Colchester, and/or Pictou County, 10.6% in the Cape Breton Regional Municipality and/or Victoria County, 6.4% in Annapolis, Kings, and/or Hants County, and less than 5% of participants worked in Digby, Yarmouth, and/or Shelburne County, or Guysborough, Antigonish, Inverness, and/or Richmond County. Fourteen point nine percent of participants did not specify their work region (see Table 1). Thirty-eight point three percent of participants reported working for a school board, 19.1% in a hospital, and 23.4% worked in either private practice, another workplace, or in a combination of work places. See Table 1 for a more detailed breakout of participation by workplace. Eighty-three percent of participants reported working full time as a psychologist/candidate registered, and six point four percent reported working part time. Sixty-one point nine percent of participants had a Masters degree and 38.1% held a Doctorate (see Table 1). When asked how many years they had been practicing psychologists/candidates registered, 36.2% said 0-5 years,

21.3% said 6-10 years, 14.9% said 11-15 years, 6.4% said 16-20 years, and 10.6% said 21-25 years (see Table 1). When asked how many years they had been performing psycho-educational assessments, 31.9% said 0-5 years, 27.7% said 6-10 years, 12.8% said 11-15 years, 10.6% said 16-20 years, 4.3% said 21-25 years, and 2.1% said over 30 years (see Table 1). Treatment of participants throughout the duration of the study was in accordance with the ethical guidelines of the CPA and APA and was approved by the Mount Saint Vincent University Ethics Review Board.

Table 1

Descriptive Statistics for Participants

Demographic Variable	*n*	Percentages (%)
Sex	42	Male: 9.5% Female: 88.1% Prefer not to answer: 2.4%
Age	42	Under 25: 0% 25-34: 50.0% 35-44: 21.4% 45-54: 23.8% 55-64: 4.8% 65 or over: 0%
Region	40	Digby, Yarmouth, and/or Shelburne County: 5.0% Annapolis, Kings, and/or Hants County: 7.5% Halifax Regional Municipality: 57.5% Cumberland, Colchester, and/or Pictou County: 15.0% Guysborough, Antigonish, Inverness, and/or Richmond County: 2.5% Cape Breton Regional Municipality and/or Victoria County: 12.5% Other: 0%

Table 1 (*Continued)*

Demographic Variable	*n*	Percentages (%)
Workplace by type	38	School Board: 47.4%
		Hospital: 23.7%
		Private Practice/Other/More than one workplace: 28.9%
Workplace (detailed)	38	
		Annapolis Valley Regional School Board: 5.3%
		Cape Breton-Victoria Regional School Board: 7.9 %
		Chignecto-Central Regional School Board: 7.9%
		Halifax Regional School Board: 15.8%
		South Shore Regional School Board: 0%
		Strait Regional School Board: 2.6%
		Tri-County Regional School Board: 5.3%
		Conseil Scolaire Acadien Provincial: 0%
		Private/Other School Board: 2.6%
		Hospital: 23.7%
		Private Practice:10.5%
		Other: 5.3%
		More than one workplace (e.g., Hospital and Private Practice): 13.2%
Work full time/part time	42	Full time: 83.0%
		Part time: 6.4%

Table 1 *(Continued)*

Demographic Variable	*n*	Percentage (%)
Education	42	Masters Degree: 61.9% Doctorate: 38.1% Other: 0%
Years as Registered Psychologist or Candidate Registered	42	0-5: 40.5% 6-10: 23.8% 11-15: 16.7% 16-20: 7.1% 21-25: 11.9% 26-30: 0% Over 30: 0%
Years performing psycho-educational assessments	42	0-5: 35.7% 6-10: 31.0% 11-15: 14.3% 16-20: 11.9% 21-25:4.8% 26-30: 0% Over 30: 2.4%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding

Measures

A questionnaire for this study was designed by the researcher (see Appendix 4). In the first section of the questionnaire, participants were provided with a list of tests and procedures commonly included in the psycho-educational assessment process. Some of the items in this first section were adapted from Woods and Farrell's (2006) survey of educational psychologists in England and Wales, and those items are indicated on the questionnaire with an asterisk. Participants were asked to indicate which tests/procedures they use "always or almost always," "occasionally," or "rarely or never." The "rarely or never" selection was broken into two response options: "do not have sufficient resources, training, or support to use the test/procedure" or "do not like to use the test/procedure." Participants were also given the option to select "unfamiliar with this test or procedure" or "not applicable." Respondents who indicated that they administer a full or partial cognitive assessment battery were asked to indicate which battery they use most often. In the next section of the questionnaire, participants were given an identical list of tests and procedures but were asked to indicate their preferences for each item. Response options included the following: "use and prefer," "use but do not prefer," "do not use but would prefer to use, given sufficient resources, training, and support," and "do not use and would not prefer to use." Again, respondents were given the option to indicate if the test or procedure was unfamiliar or not applicable to them. In order to determine whether a difference exists between what tests and procedures practitioners may prefer to use versus those they may actually use, they were asked to select from the same list which tests or procedures they do not currently use but would <u>definitely</u> use given sufficient resources, training, and support. At the end of the first section, participants were asked to rank their overall satisfaction with their current approach to psycho-educational assessment.

In the next section of the questionnaire, participants were asked to complete an adapted version of Aarons' (2005) Evidence-Based Practice Attitude Scale (EBPAS). The total scale score is composed of four subscales: Appeal, representing "the extent to which the provider would adopt an EBP [evidence-based practice] if it were intuitively appealing, could be used correctly, or was being used by colleagues who were happy with it (p. 5)"; Requirements, representing "the extent to which the provider would adopt an EBP if it were required by an agency, supervisor, or state (p. 5)"; Openness, representing "the extent to which the provider is generally open to trying new interventions and would be willing to try or use EBPs (p. 5)"; and Divergence, representing "the extent to which the provider perceives EBPs as not clinically useful and less important than clinical experience (p.5)." Since Aarons originally developed and validated the scale for use with United States mental health practitioners, the survey has been modified for this study to focus on learning disability assessment with a Canadian population. For example, the item, "Research-based treatments/interventions are not clinically useful," has been revised to read, "Research-based **assessments/**interventions are not clinically useful" (bold added for emphasis). Other items from the adapted EBPAS scale include, "I like to use new learning disability assessment techniques/interventions to help my clients," and, "clinical experience is more important than using research-based assessment techniques/interventions." In addition to rewording original items, the following item was added to the Appeal subscale: "If you received training in an assessment technique/intervention that was new to you, how likely would you be to adopt it if:… you felt you had enough time?" This item was added due to the researcher's personal experiences with psychology professionals who frequently describe feeling like they do not have enough time to do everything they want to do with their practices. Participants are asked to rank how much they agree with each statement, and response options include the following: 0 – Not at All, 1 – To a Slight Extent, 2 – To a Moderate Extent, 3 – To a

Great Extent, and 4 – To a Very Great Extent (numbered 1-5 for analyses). Items 3, 5, 6, and 7 are reverse-coded for the scale total. The EBPAS has been found to be reliable, with an overall Cronbach's alpha of .77 and subscale alphas ranging from .90 to .59 (Aarons, 2005, p. 5). Aarons' validity testing also indicated that the EBPAS scores vary based on relevant personal and organizational characteristics (for instance, interns and those with higher educational attainment regularly scored higher than others on the EBPAS), indicating that the scales are measuring what they are intended to measure (2005). Further analyses were done to examine the reliability of the revised EBPAS with the current sample (see Results).

In the next section of the questionnaire, items were focused on practitioners' attitudes toward IQ testing and the discrepancy model and on measures regularly taken for professional development. An example item referring to the discrepancy model is, "presence of an IQ-achievement discrepancy is sufficient for the diagnosis of a learning disability." Participants were asked to rank how much they agree with the statements based on the scale described above. For the professional development section, practitioners were asked to indicate how often they engage in a list of activities for purposes of professional development. The response options included the following: 0 – Never, 1 – Occasionally, and 2 – Regularly (numbered 1-3 for analyses); a "not applicable" possibility existed for specific items that may not have applied to all psychologists conducting LD assessment in Nova Scotia. Example items from this section include, "read peer-reviewed journal articles" and "consult with other psychologists or assessment professionals regarding assessment practices."

The final section of the questionnaire consisted of a brief demographic section, in which participants were asked their age range, sex, geographic region in which they work, workplace, full-time or part-time employment status, education level, number of years working as a psychologist/candidate register, and number of years practicing psycho-educational assessment.

Procedure

The questionnaire for this study was available online through Freeonlinesurveys.com, an online survey host based in the United Kingdom. A non-US based survey site was chosen since any information made available through a US server is subject to the Patriot Act, which violates Canadian privacy laws (Information & Privacy Commissioner for British Columbia, 2004).

Nova Scotian psychologists and those on the Candidates Registered list were sent an email briefly discussing the study and requesting their participation in the 8-10 minute questionnaire. Only those who currently conducted psycho-educational assessments in the learning disability field were asked to follow the link to the online survey. It was clear from the email that participation was entirely voluntary and that the researchers and their employers would not know who participated or who chose not to.

Those who chose to participate clicked on a link in the email that brought them to the online survey. The first page of the survey was an informed consent form (Appendix 3), which explained the confidentiality of the study and made it clear to potential participants that they could discontinue the survey at any time and skip any questions they did not wish to answer. The informed consent form also listed the names and contact information for the principal researcher, her supervisor, and the university Ethics Research Coordinator. It was made clear at the end of the consent form that by continuing on with the questionnaire, participants were giving their informed consent to do so.

The questionnaire took approximately 8-10 minutes to complete. Upon finishing the survey, participants had the option to send an email to the principal researcher asking for the results of the completed study. Any emails sent to the researcher were not linked in any way to participants' individual survey responses. Upon completion of the study, those participants who requested results to the survey were sent a description of the major findings. Individual

responses to the questionnaire are private, and only group results have been reported. In order to protect participants' anonymity, region and workplace variables were recoded into letter symbols for reporting purposes.

Chapter III: Results

Scale Testing

Scale testing began with an exploratory factor analysis (EFA) to confirm the underlying structure of the adapted Evidence-Based Practice Attitude Scale (EBPAS) (Aarons, 2005). A principle-components analysis was conducted with varimax rotation, as non-rotated factor loadings were close together. The EFA confirmed Aaron's four original subscales: Appeal, Requirements, Openness, and Divergence. The added item ("time") loaded as expected on the Appeal Subscale. The scale was strengthened by removing the following item, which loaded weakly on more than one scale: Item 14: "If you received training in an assessment technique/intervention that was new to you, how likely would you be to adopt it if:… it was being used by colleagues who were happy with it?" The remaining items loaded as expected on the appropriate subscales. The final result was confirmation of the four subscales, consistent with Aaron's original EBPAS, with factor loadings of .50 or higher and Eigenvalues of at least 1.0, explaining 78.7% of the variance. Scale testing continued with a confirmatory factor analysis (CFA) of each of the subscales, extracting a single factor. The results demonstrated unidimensionality of each subscale with factor loadings of .50.

Scale reliability was tested using Cronbach's Alpha. A test was conducted on each subscale and on the additive scale as a whole. Each subscale, and the entire scale, exceeded the desired Cronbach's Alpha level of .70 or higher. Cronbach's Alpha for the Scale Total was .74 (see Table 2). See Tables 3-6 for the Cronbach's Alpha levels, means, standard deviations, and factor loadings for each subscale and for the Scale Total. The revised EBPAS scale proved to be reliable for use as an additive scale in this research.

Table 2

Reliability Analysis of EBPAS Scale Total

Scale Item	*n*	Mean	Std. Dev
1) Appeal Subscale	36	16.47	2.56
2) Requirements Subscale	36	10.92	3.16
3) Openness Subscale	36	15.78	2.84
4) Divergence Subscale	36	18.11	2.03
EBPAS Scale Total	36	61.28	8.03

Cronbach's alpha = .74

Note. $N = 47$. Maximum Possible Scale Values: Appeal = 20, Requirements = 15, Openness = 20, Divergence = 20, Scale Total = 75.

Table 3

Reliability Analysis of EBPAS Appeal Subscale

Scale Item	*n*	Mean	Std. Dev	Factor Loading
1) How likely to use if… had enough time	37	4.24	0.64	0.93
2) How likely to use if… "made sense" to you	37	4.08	0.72	0.926
3) How likely to use if… had enough training	37	4.27	0.60	0.90
4) How likely to use if… intuitively appealing	37	3.76	0.95	0.85

Cronbach's alpha = .91

Note. $N = 47$, Scale: 1) Not at All, 2) To a Slight Extent, 3) To a Moderate Extent, 4) To a Great Extent, 5) To a Very Great Extent

Table 4

Reliability Analysis of EBPAS Requirements Subscale

Scale Item	*n*	Mean	Std. Dev	Factor Loading
1) How likely to use if… required by agency/school board	43	3.53	1.14	0.94
2) How likely to use if… required by supervisor	43	3.40	1.22	0.93
3) How likely to use if… required by province	43	3.86	0.99	0.89

Cronbach's alpha = .91

Note. $N = 47$, Scale: 1) Not at All, 2) To a Slight Extent, 3) To a Moderate Extent, 4) To a Great Extent, 5) To a Very Great Extent

Table 5

Reliability Analysis of EBPAS Openness Subscale

Scale Item	*n*	Mean	Std. Dev	Factor Loading
1) Willing to try specified, step-by-step procedure	45	4.07	0.75	0.88
2) Willing to use new techniques developed by researchers	45	4.00	0.77	0.87
3) Like to use new LD assessment techniques	45	3.87	0.69	0.83
4) Would try new technique even if very different from what I am used to doing	45	3.73	0.92	0.82

Cronbach's alpha = .87

Note. $N = 47$, Scale: 1) Not at All, 2) To a Slight Extent, 3) To a Moderate Extent, 4) To a Great Extent, 5) To a Very Great Extent

Table 6

Reliability Analysis of EBPAS Divergence Subscale

Scale Item	*n*	Mean	Std. Dev	Factor Loading
1) Clinical experience more important than research-based assessment	43	4.44	0.67	0.85
2) I know better than academic researchers how to care for my clients	43	4.12	0.96	0.76
3) Research-based assessments are not clinically useful	43	4.79	0.47	0.70
4) Would not use specified, step-by-step approach	43	4.84	0.49	0.65

Cronbach's alpha = .70

Note. $N = 47$, Scale: 1) Not at All, 2) To a Slight Extent, 3) To a Moderate Extent, 4) To a Great Extent, 5) To a Very Great Extent (items on this subscale are reverse-coded)

Research Question One: What psycho-educational assessment approaches are Nova Scotian psychologists/candidates registered currently using with respect to learning disabilities?

Frequencies were run to determine what percentage of participants reported using specified tests and procedures as a part of their psycho-educational assessment practice. Table 7 displays participants' responses for each of the tests and procedures listed in the questionnaire matrix. Anecdotal responses generally represented three primary themes. Many participants responded by listing other tests or procedures that they use regularly (e.g., "BASC" – Behavior Assessment System for Children, Second Edition). Others stated that they did not have sufficient

resources available through their workplace to use the tests or procedures that they would like to use (e.g., “We have very limited testing resources within... School Board. I use some of the tools because they are the only ones available”). Some participants also described why they chose not to use certain tests or procedures (e.g., “...I have always found behavioural checklists to be almost useless, frequently misused [e.g., as a definitive diagnosis for ADHD], and providing as much information about the rater as the child”). See Appendix 5 for verbatim anecdotal responses, minus identifying information.

Table 7

NS Psychologists/Candidates Registered use of Psycho-educational Tests and Procedures

Test or Procedure	*n*	Percentages (%)
Interview a parent or guardian	47	Use rarely or never (insufficient resources): 4.3% Use rarely or never (do not like): 0% Use occasionally: 8.5% Use always or almost always: 87.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Interview client	47	Use rarely or never (insufficient resources): 0% Use rarely or never (do not like): 0% Use occasionally: 17.0% Use always or almost always: 83.0% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Interview school staff	47	Use rarely or never (insufficient resources): 0% Use rarely or never (do not like): 4.3% Use occasionally: 19.1% Use always or almost always: 76.6% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Observe child in classroom	47	Use rarely or never (insufficient resources): 14.9% Use rarely or never (do not like): 6.4% Use occasionally: 55.3% Use always or almost always: 23.4% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Observe child on the playground	47	Use rarely or never (insufficient resources): 17.0% Use rarely or never (do not like): 14.9% Use occasionally: 55.3% Use always or almost always: 10.6% Unfamiliar with this test or procedure: 0% Not applicable: 2.1%
Observe child in physical education class	47	Use rarely or never (insufficient resources): 19.1% Use rarely or never (do not like): 25.5% Use occasionally: 51.1% Use always or almost always: 4.3% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Review child's cumulative education file	47	Use rarely or never (insufficient resources): 8.5% Use rarely or never (do not like): 6.4% Use occasionally: 2.1% Use always or almost always: 78.7% Unfamiliar with this test or procedure: 0% Not applicable: 4.3%
Full cognitive assessment battery	47	Use rarely or never (insufficient resources): 2.1% Use rarely or never (do not like): 0% Use occasionally: 2.1% Use always or almost always: 95.7% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Partial cognitive assessment battery	45	Use rarely or never (insufficient resources): 6.5% Use rarely or never (do not like): 30.4% Use occasionally: 34.8% Use always or almost always: 19.6% Unfamiliar with this test or procedure: 0% Not applicable: 8.7%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Specific test of phonological processing	47	Use rarely or never (insufficient resources): 6.4% Use rarely or never (do not like): 8.5% Use occasionally: 34.0 Use always or almost always: 51.1% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Specific test of memory/attention	47	Use rarely or never (insufficient resources): 6.4% Use rarely or never (do not like): 8.5% Use occasionally: 48.9% Use always or almost always: 36.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Specific test of processing speed	47	Use rarely or never (insufficient resources): 0% Use rarely or never (do not like): 2.1% Use occasionally: 0% Use always or almost always: 95.7% Unfamiliar with this test or procedure: 2.1% Not applicable: 0%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Specific test of visual-motor processing	47	Use rarely or never (insufficient resources): 4.3% Use rarely or never (do not like): 23.1% Use occasionally: 19.1% Use always or almost always: 74.5% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Full achievement battery	47	Use rarely or never (insufficient resources): 2.1% Use rarely or never (do not like): 4.3% Use occasionally: 8.5% Use always or almost always: 85.1% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Partial achievement battery	46	Use rarely or never (insufficient resources): 6.5% Use rarely or never (do not like): 30.4% Use occasionally: 34.8% Use always or almost always: 19.6% Unfamiliar with this test or procedure: 0% Not applicable: 8.7%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Formal evaluation of child's prior response to intervention	46	Use rarely or never (insufficient resources): 23.9% Use rarely or never (do not like): 15.2% Use occasionally: 32.6% Use always or almost always: 17.4% Unfamiliar with this test or procedure: 6.5% Not applicable: 4.3%
IQ-achievement discrepancy analysis based on full scale IQ or general ability index	47	Use rarely or never (insufficient resources): 4.3% Use rarely or never (do not like): 23.4% Use occasionally: 23.4% Use always or almost always: 48.9% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carrol (CHC) theory	45	Use rarely or never (insufficient resources): 17.0% Use rarely or never (do not like): 23.4% Use occasionally: 17.0% Use always or almost always: 38.3% Unfamiliar with this test or procedure: 4.3% Not applicable: 0%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Achenbach and/or Conners Teacher Report Form	46	Use rarely or never (insufficient resources): 0% Use rarely or never (do not like): 10.9% Use occasionally: 41.3% Use always or almost always: 47.8% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Achenbach and/or Conners Parent Report Form	47	Use rarely or never (insufficient resources): 0% Use rarely or never (do not like): 10.6% Use occasionally: 40.4% Use always or almost always: 48.9% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Achenbach and/or Conners Self-Report Form	46	Use rarely or never (insufficient resources): 2.2% Use rarely or never (do not like): 15.2% Use occasionally: 60.9% Use always or almost always: 21.7% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 7 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Evaluation of personality, behavioural, and emotional functioning (excluding Achenbach and Conners checklists)	46	Use rarely or never (insufficient resources): 6.5% Use rarely or never (do not like): 8.7% Use occasionally: 54.3% Use always or almost always: 30.4% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding

Chi-square analyses were run to determine whether participants' use of specific tests and procedures varied by region, workplace, age, education level, and/or years as a registered psychologist or candidate register. Test/procedure use was not run by sex since only four males participated in the study. Monte Carlo exact tests were used to compensate for sparse cell sizes, and paired comparisons were run on significant results in order to determine which levels of the independent (demographic) variables were responsible for the statistical significance. No significant differences were found when participants' test and procedure use was run by years as registered psychologists/candidates registered. Significant findings for other demographic variables are described below.

First, chi-squares were run to compare participant test and procedure use by geographic region. The only significant finding by region was for the use of a memory/attention test, χ^2 (15, $n = 40$) = 29.21, $p < .05$. However, paired comparisons did not find any significant differences from what would be expected for each of the different levels of the region variable, indicating that statistically significant differences on the original chi-square test were not salient enough to

show up in breakout chi-squares. All other chi-square tests comparing test and procedure use by region were non-significant.

The workplace variable was regrouped in order to create a separate level for participants who reported working in more than one work setting (e.g., hospital and private practice). This was done in order to have a single workplace variable with an accurately recorded sample size (i.e., so that no set of responses was counted more than once). A chi-square test indicated that participants' use of playground observations varied significantly by workplace, χ^2 (30, n = 37) = 44.289, $p < .05$. Paired comparisons found that significant differences existed for playground observation use between those working in School Board D and those working in a hospital setting, χ^2 (3, n = 12) = 8.00, $p < .05$. Significant differences also existed for use of playground observations between those who work for School Board E and those working in a hospital setting, χ^2 (3, n = 15) = 7.00, $p < .05$. As might be expected, playground observations were more likely to be used occasionally or always/almost always by those working for School Board D (100%) and School Board E (67.7%) than by those working in a hospital setting (22.2%). While no participants from School Boards D and E reported using playground observations rarely or never due to insufficient resources, support, or training, this option was selected by 55.6% of hospital-based participants.

Since no participants reported being under 25 years old or over 64 years old, the age variable was regrouped into three categories: 34 and under, 35-44, and 45 and over. Psychologists' and candidates' registered test and procedure use did not vary significantly by age, with the exception of the use of partial achievement batteries, which was significantly different by age, χ^2 (6, n = 38) = 13.15, $p < .05$. Paired comparisons were run to determine what levels of the age variable differed with respect to partial achievement battery use. Significant differences existed between the 34 and under age group and the 35-44 age group, χ^2 (3, n = 27) =

10.16, $p < .05$. Participants in the 35-44 age group were more likely to report using a partial achievement battery always or almost always (44.4% compared to 11.1% in the 34 and under group), and participants in the 34 and under age group were more likely to report using a partial achievement battery occasionally (55.6% compared to 11.1% in the 35-44 group). Twenty-two point two percent of those in the 35-44 group reported rarely or never using a partial achievement battery due to insufficient resources, support, or training, compared to none of the participants in the 34 and under group. Thirty-three point three percent of those in the 34 and under group reported using a partial achievement battery rarely or never due to not liking to use that procedure, compared to 22.2% of those in the 35-44 group.

Chi-square tests were run to see if test and procedure use varied by education level. Significant results were found for teacher interview use, χ^2 (2, $n = 42$) = 5.49, $p < .05$, playground observation use, χ^2 (3, $n = 41$) = 8.08, $p < .05$, use of CHC/cross battery assessment methods, χ^2 (3, $n = 40$) = 12.00, $p < .01$, Achenbach/Conners Teacher Form use, χ^2 (2, $n = 41$) = 9.96, $p < .01$, and Achenbach/Conners Parent Form use, χ^2 (2, $n = 42$) = 9.08, $p < .05$. Paired comparisons were not run since the demographic variable, education level, has only two levels: masters degree or doctoral degree. Given that several tests and procedures varied significantly by education level, the results of these paired comparisons are recorded in Table 8.

Table 8

Significant Chi-Square Results for Test/Procedure use by Highest Attained Level of Education

Test or Procedure	*n*	Use	Education Level	
			Masters	Doctorate
Use teacher interview	42	Use rarely or never (insufficient support)	0%	0%
		Use rarely or never (do not like)	0%	12.5%
		Use occasionally	15.4%	31.3%
		Use always or almost always	84.6%	56.3%
Use playground observations	41	Use rarely or never (insufficient support)	12.0%	31.3%
		Use rarely or never (do not like)	8.0%	25.0%
		Use occasionally	76.0%	31.3%
		Use always or almost always	4.0%	12.5%
Use CHC/cross battery assessment methods	40	Use rarely or never (insufficient support)	23.1%	14.3%
		Use rarely or never (do not like)	7.7%	57.1%
		Use occasionally	19.2%	7.1%
		Use always or almost always	50.0%	21.4%
Use Achenbach/ Conners Teacher Form	41	Use rarely or never (insufficient support)	0%	0%
		Use rarely or never (do not like)	12.0%	12.5%
		Use occasionally	60.0%	12.5%
		Use always or almost always	28.0%	75.0%
Use Achenbach/ Conners Parent Form	42	Use rarely or never (insufficient support)	0%	0%
		Use rarely or never (do not like)	11.5%	12.5%
		Use occasionally	57.7%	12.5%
		Use always or almost always	30.8%	75.0%

Note. $N = 47$

Participants who responded that they use full or partial cognitive test batteries were asked to specify which battery they use most often (see Table 9).

Table 9

Cognitive Test Used Most Often

Cognitive Test	Percentage (%)
Wechsler Intelligence Scales	80.4%
Woodcock Johnson III	15.2%
Stanford-Binet Intelligence Scales, Fifth Edition	0%
Other	4.3%

Note. $N = 47$, $n = 46$

As with the prior list of tests and procedures, chi-square tests were run to see if cognitive test used most often varied by demographic factors. All results were non-significant except for a comparison of cognitive test used by region, which was statistically significant, χ^2 (10, $n = 39$) = 25.53, $p < .05$. Paired comparisons were conducted to see what level(s) of the region variable differed with respect to cognitive test used most often. Significantly different paired comparisons included Region C and Region B, χ^2 (2, $n = 25$) = 25.00, $p < .001$, and Region C and Region A, χ^2 (1, $n = 9$) = 5.63, $p < .05$. Those from Region C were more likely to report using the Woodcock Johnson III (100%) than those from either of the other geographic regions (0% in Region B and 16.7% in Region A). Participants from both of the other regions reported primarily using the Weschler Intelligence Scales (95.5% in Region B, 83.3% in Region A, and 0% in Region C).

Research Question Two: What psycho-educational assessment approaches would Nova Scotian psychologists/candidates registered prefer to use if given the freedom and resources to choose?

Frequencies were run to determine what percentage of participants reported a preference for specified psycho-educational tests and procedures. Table 10 displays participants' preferences for each of the tests and procedures listed in the questionnaire matrix. Once again, most anecdotal responses fell within three main categories. Some participants listed other tests or procedures that they prefer (e.g., "BASC-2, BRIEF"). Others described workplace limitations in test or procedure use (e.g., "I don't like Achenbach scales. I use them only because it's all we have access to. Would prefer to use the BASC.") Some participants also described why they did not prefer certain tests or procedures (e.g., [sic]"...The Achenbach checklists are outdated and only have one normative sample, I don't find it age specific enough"). See Appendix 5 for verbatim anecdotal responses.

Table 10

NS Psychologists/Candidates Registered Preferences for Psycho-educational Tests and Procedures

Test or Procedure	*n*	Percentages (%)
Interview a parent or guardian	45	Use and prefer: 91.1% Use but do not prefer: 0% Do not use but would prefer to use, given sufficient resources, training, and support: 8.9% Do not use and would not prefer to use: 0% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Interview client	45	Use and prefer: 93.3% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 4.4% Do not use and would not prefer to use: 0% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Interview school staff	45	Use and prefer: 82.2% Use but do not prefer: 0% Do not use but would prefer to use, given sufficient resources, training, and support: 15.6% Do not use and would not prefer to use: 2.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Observe child in classroom	45	Use and prefer: 73.3% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 20.0% Do not use and would not prefer to use: 4.4% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Observe child on the playground	43	Use and prefer: 53.5% Use but do not prefer: 11.6% Do not use but would prefer to use, given sufficient resources, training, and support: 25.6% Do not use and would not prefer to use: 9.3% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Observe child in physical education class	44	Use and prefer: 40.9% Use but do not prefer: 11.4% Do not use but would prefer to use, given sufficient resources, training, and support: 25.0% Do not use and would not prefer to use: 22.7% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Review child's cumulative education file	43	Use and prefer: 76.7% Use but do not prefer: 2.3% Do not use but would prefer to use, given sufficient resources, training, and support: 14.0% Do not use and would not prefer to use: 4.7% Unfamiliar with this test or procedure: 0% Not applicable: 2.3%
Full cognitive assessment battery	45	Use and prefer: 93.3% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 0% Do not use and would not prefer to use: 4.4% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Partial cognitive assessment battery	43	Use and prefer: 30.2% Use but do not prefer: 25.6% Do not use but would prefer to use, given sufficient resources, training, and support: 4.7% Do not use and would not prefer to use: 27.9% Unfamiliar with this test or procedure: 0% Not applicable: 11.6%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Specific test of phonological processing	45	Use and prefer: 80.0% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 15.6% Do not use and would not prefer to use: 2.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Specific test of memory/attention	44	Use and prefer: 70.5% Use but do not prefer: 11.4% Do not use but would prefer to use, given sufficient resources, training, and support: 15.9% Do not use and would not prefer to use:2.3 % Unfamiliar with this test or procedure: 0% Not applicable: 0%
Specific test of processing speed	45	Use and prefer: 95.6% Use but do not prefer: 0% Do not use but would prefer to use, given sufficient resources, training, and support: 2.2% Do not use and would not prefer to use: 2.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Specific test of visual-motor processing	45	Use and prefer: 88.9% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 4.4% Do not use and would not prefer to use: 4.4% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Full achievement battery	43	Use and prefer: 86.0% Use but do not prefer: 2.3% Do not use but would prefer to use, given sufficient resources, training, and support: 4.7 % Do not use and would not prefer to use: 7.0% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Partial achievement battery	43	Use and prefer: 30.2% Use but do not prefer: 25.6% Do not use but would prefer to use, given sufficient resources, training, and support: 4.7% Do not use and would not prefer to use: 27.9% Unfamiliar with this test or procedure: 0% Not applicable: 11.6%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Formal evaluation of child's prior response to intervention	43	Use and prefer: 27.9% Use but do not prefer: 2.3% Do not use but would prefer to use, given sufficient resources, training, and support: 41.9% Do not use and would not prefer to use: 7.0% Unfamiliar with this test or procedure: 14.0% Not applicable: 7.0%
IQ-achievement discrepancy analysis based on full scale IQ or general ability index	44	Use and prefer: 38.6% Use but do not prefer: 31.8% Do not use but would prefer to use, given sufficient resources, training, and support: 0% Do not use and would not prefer to use: 29.5% Unfamiliar with this test or procedure: 0% Not applicable: 0%
Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carrol (CHC) theory	45	Use and prefer: 42.2% Use but do not prefer: 2.2% Do not use but would prefer to use, given sufficient resources, training, and support: 35.6% Do not use and would not prefer to use: 13.3% Unfamiliar with this test or procedure: 6.7% Not applicable: 0%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Achenbach and/or Conners Teacher Report Form	45	Use and prefer: 71.1% Use but do not prefer: 17.8% Do not use but would prefer to use, given sufficient resources, training, and support: 4.4% Do not use and would not prefer to use: 4.4% Unfamiliar with this test or procedure: 2.2% Not applicable: 0%
Achenbach and/or Conners Parent Report Form	45	Use and prefer: 71.1% Use but do not prefer: 17.8% Do not use but would prefer to use, given sufficient resources, training, and support: 4.4% Do not use and would not prefer to use: 4.4% Unfamiliar with this test or procedure: 2.2% Not applicable: 0%
Achenbach and/or Conners Self-Report Form	45	Use and prefer: 62.2% Use but do not prefer: 17.8% Do not use but would prefer to use, given sufficient resources, training, and support: 6.7% Do not use and would not prefer to use: 11.1% Unfamiliar with this test or procedure: 2.2% Not applicable: 0%

Table 10 *(Continued)*

Test or Procedure	*n*	Percentages (%)
Evaluation of personality, behavioural, and emotional functioning (excluding Achenbach and Conners checklists)	45	Use and prefer: 71.1% Use but do not prefer: 6.7% Do not use but would prefer to use, given sufficient resources, training, and support: 20.0% Do not use and would not prefer to use: 2.2% Unfamiliar with this test or procedure: 0% Not applicable: 0%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding

In addition to being asked about their preferences for different psycho-educational tests and procedures, participants were also asked to select which tests and procedures they do not currently use but believe they would "definitely" use given sufficient resources, training, and support. The percentage of participants who selected each test and procedure may be seen in Table 11.

Table 11

Tests or Procedures NS Psychologists/Candidates Registered do not Currently use but Would Definitely use Given Sufficient Resources, Training, and Support

Test or Procedure	Percentage (%) of Participants who Selected This Test/Procedure
Interview a parent or guardian	10.6%
Interview client	6.4%
Interview school staff	8.5%
Observe child in classroom	19.1%
Observe child on the playground	14.9%
Observe child in physical education class	14.9%
Review child's cumulative education file	17.0%
Full cognitive assessment battery	4.3%
Partial cognitive assessment battery	2.1%
Specific test of phonological processing	10.6%
Specific test of memory/attention	12.8%
Specific test of processing speed	0%
Specific test of visual-motor processing	0%
Full achievement battery	0%

Table 11 *(continued)*

Test or Procedure	Percentage (%) of Participants who Selected This Test/Procedure
Partial achievement battery	6.4%
Formal evaluation of child's prior response to intervention	27.7%
IQ-achievement discrepancy analysis based on full scale IQ or general ability index	2.1%
Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carrol (CHC) theory	23.4%
Achenbach and/or Conners Teacher Report Form	2.1%
Achenbach and/or Conners Parent Report Form	2.1%
Achenbach and/or Conners Self-Report Form	2.1%
Evaluation of personality, behavioural, and emotional functioning (excluding Achenbach and Conners checklists)	19.1%
Other test or procedure	10.6

Note. $N = 47$

Chi-square analyses were run to determine whether participants' preferences for specific tests and procedures varied by region, workplace, age, education level, and/or years as a registered psychologist or candidate register. Again, Monte Carlo exact tests were used to compensate for sparse cell sizes, and paired comparisons were run on significant results in order

to determine which levels of the independent (demographic) variables were responsible for the statistical significance.

First, chi-squares were run to compare participant test and procedure preference by geographic region. Significant findings were found for parent interview preference, χ^2 (4, n = 40) = 19.02, $p < .01$, client interview preference, χ^2 (8, n = 38) = 20.73, $p < .05$, and Achenbach/Conners Teacher Form and Parent Form preference, each χ^2 (12, n = 37) = 29.46, $p <$ .05. However, paired comparisons did not show any significant differences from what would be expected for each level of the region variable for client interview, Achenbach/Conners Teacher Form, or Achenbach/Conners Parent Form, indicating that statistically significant differences on the original chi-square tests were not salient enough to show up in breakout chi-squares. A significant paired comparison was found for parent interview preference when run by Region D and Region B, χ^2 (1, n = 24) = 15.27, $p < .05$. While 100% of those participants from Region D said that they did not use but would prefer to use parent interviews with sufficient resources, training, or support, 95.5% of those in Region B reported using and preferring parent interviews.

Next, chi-squares were run to compare participant test and procedure preference by workplace. Several preferences varied significantly by workplace, including classroom observation preference, χ^2 (30, n = 37) = 60.47, $p < .05$, playground observation preference, χ^2 (30, n = 36) = 62.26, $p < .001$, physical education observation preference, χ^2 (30, n = 36) = 53.43, $p = .001$, partial cognitive assessment preference, χ^2 (30, n = 33) = 42.67, $p < .05$, and CHC/cross battery assessment preference, χ^2 (30, n = 35) = 63.76, $p < .01$. Significant paired comparisons are shown in Tables 12-16.

Table 12

Significant Paired Comparisons for Classroom Observation Preference by Workplace

Paired Comparison Statistic	Workplaces	Preference Level			
		Use and prefer	Use but do not prefer	Do not use but would prefer to use	Do not use and would not prefer to use
χ^2 (1, n = 11) = 7.22, p < .05	School Board B	100%	0%	0%	0%
	Hospital	12.5%	0%	87.5%	0%
χ^2 (2, n = 11) = 7.64, p < .05	School Board D	66.7%	33.3%	0%	0%
	Hospital	12.5%	0%	87.5%	0%
χ^2 (1, n = 14) = 10.50, p < .01	School Board E	100%	0%	0%	0%
	Hospital	12.5%	0%	87.5%	0%
χ^2 (2, n = 12) = 9.00, p < .01	Hospital	12.5%	0%	87.5%	0%
	Private Practice	50.0%	0%	0%	50.0%
χ^2 (1, n = 8) = 8.00, p < .05	School Board E	100%	0%	0%	0%
	School Board F	0%	0%	100%	0%

Table 13

Significant Paired Comparisons for Playground Observation Preference by Workplace

Paired Comparison Statistic	Workplaces	Preference Level			
		Use and prefer	Use but do not prefer	Do not use but would prefer to use	Do not use and would not prefer to use
χ^2 (2, n = 11) = 11.00, p < .01	School Board B	100%	0%	0%	0%
	Hospital	0%	0%	87.5%	12.5%
χ^2 (3, n = 11) = 11.00, p = .01	School Board D	33.3%	66.7%	0%	0%
	Hospital	0%	05	87.5%	12.5%
χ^2 (2, n = 14) = 10.43, p < .01	School Board E	83.3%	0%	16.7%	0%
	Hospital	0%	0%	87.5%	12.5%
χ^2 (2, n = 11) = 7.64, p < .05	Hospital	0%	0%	87.5%	12.5%
	Private Practice	33.3%	0%	0%	66.7%

Table 14

Significant Paired Comparisons for Phys-ed Observation Preference by Workplace

Paired Comparison Statistic	Workplaces	Preference Level			
		Use and prefer	Use but do not prefer	Do not use but would prefer to use	Do not use and would not prefer to use
χ^2 (3, n = 10) = 10.00, p < .05	School Board C	50.0%	50.0%	0%	0%
	Hospital	0%	0%	50.0%	50.0%
χ^2 (2, n = 11) = 11.00, p < .01	School Board B	100%	0%	0%	0%
	Hospital	0%	0%	50.0%	50.0%
χ^2 (2, n = 13) = 9.62, p < .05	School Board E	80.0%	0%	20.0%	0%
	Hospital	0%	0%	50.0%	50.0%
χ^2 (3, n = 8) = 8.00, p < .05	School Board D	0%	66.7%	0%	33.3%
	School Board E	80.0%	0%	20.0%	0%

Table 15

Significant Paired Comparisons for Partial Cognitive Assessment Preference by Workplace

Paired Comparison Statistic	Workplaces	Preference Level			
		Use and prefer	Use but do not prefer	Do not use but would prefer to use	Do not use and would not prefer to use
χ^2 (2, n = 8) = 8.00, p < .05	School Board C	100%	0%	0%	0%
	School Board E	0%	0%	16.7%	83.3%
χ^2 (2, n = 8) = 8.00, p < .05	School Board E	0%	0%	16.7%	83.3%
	School Board F	100%	0%	0%	0%

Table 16

Significant Paired Comparisons for CHC/Cross Battery Assessment Preference by Workplace

Paired Comparison Statistic	Workplaces	Preference Level				
		Use and prefer	Use but do not prefer	Do not use but would prefer to use	Do not use and would not prefer to use	Unfamiliar with Test and Procedure
χ^2 (2, n = 14) = 7.10, p < .05	School Board E	83.3%	0%	16.7%	0%	0%
	Hospital	12.5%	0%	75.0%	12.5%	0%
χ^2 (3, n = 10) = 7.92, p < .05	School Board E	83.3%	0%	16.7%	0%	0%
	Private Practice	0%	0%	25.0%	50.0%	25.0%

Chi-squares were run to see if test and procedure preferences varied by education level. Significant results were found for teacher interview preference, χ^2 (2, n = 41) = 6.63, p < .05, cumulative file review preference, χ^2 (3, n = 38) = 14.63, p < .001, and phonological processing

test preference, χ^2 (3, n = 41) = 8.98, p < .01. Again, paired comparisons were not run since the demographic variable has only two levels. See Table 17 for chi-square results.

Table 17

Significant Chi-Square Results for Test/Procedure Preference by Highest Attained Level of Education

Test or Procedure	*n*	Use	Education Level	
			Masters	Doctorate
Prefer teacher interview	41	Use and prefer	94.3%	60.0%
		Use but do not prefer	0%	0%
		Do not use but would prefer to use	7.7%	33.3%
		Do not use and would not prefer to use	0%	6.7%
Prefer cumulative file review	38	Use and prefer	92.0%	46.2%
		Use but do not prefer	4.0%	0%
		Do not use but would prefer to use	0%	46.2%
		Do not use and would not prefer to use	4.0%	7.7%
Prefer test of phonological processing	41	Use and prefer	92.3%	53.3%
		Use but do not prefer	0%	6.7%
		Do not use but would prefer to use	7.7%	33.3%
		Do not use and would not prefer to use	0%	6.7%

Note. N = 47

Chi-square tests were conducted to see if test and procedure preference varied by number of years as a psychologist/candidate register and by age. Although preference for evaluation of personality/behaviour/emotional functioning (excluding Achenbach/Conners forms) varied significantly by number of years as psychologist/candidate register, χ^2 (9, n = 41) = 16.45, p <

.05, differences were not salient enough to show up in paired comparisons. Chi-square tests also found that preference for a test of phonological processing varied by age, χ^2 (6, n = 41) = 17.67, $p < .01$. Paired comparisons narrowed down the significant finding to differences between the 34 and under group and the 35-44 group, χ^2 (1, n = 30) = 10.16, $p < .01$. Specifically, while 95.2% of those 34 and under selected that they use and prefer a test of phonological processing, only 44.4% of those aged 35-44 reported the same. Fifty-five point six percent of those in the 35-44 group reported that they do not use but would prefer to use a test of phonological processing with appropriate resources, training, and support. Four point eight percent of those aged 34 and under reported the same.

After giving their preferences for different tests and procedures, participants reported their overall satisfaction with their current approach to psycho-educational assessment. Satisfaction results for the sample are shown in Table 18. The majority of participants (60.9%) reported feeling somewhat satisfied with their current approach to psycho-educational assessment. Anecdotal responses regarding satisfaction generally fell into three main categories. Many participants noted that they lack sufficient resources (e.g., specific test batteries) to implement all of their preferred psycho-educational assessment methods. Some participants also felt that they'd received insufficient training in some techniques in their graduate program(s), making it difficult to implement preferred practices. Other participants noted a lack of time and/or money as a major hindrance to using some preferred assessment approaches. The following quotation from the anecdotal data represents some of the common themes found among the responses (*Note.* Quotation has been edited for spelling/typos. See Appendix 5 for a list of verbatim anecdotal responses, minus identifying information):

> I feel I lack the tools to do my job properly. We did not receive enough training on differential diagnosis within our program. Several of us are seeking outside training in

this area, but as we lack assessment measures to properly assess a child's social, emotional, and behavioural functioning, we can only do so much. I am also very much against a school board as large as ours having only one cognitive test for all children. We should be choosing cognitive tests based on the nature of the referral, and not based on "this is all I have access to".

Table 18

NS Psychologists/Candidates Registered Overall Satisfaction with Their Current Approach to Psycho-educational Assessment

Satisfaction Level	Percentage (%)
Very Dissatisfied	0%
Somewhat Dissatisfied	13.0%
Neither Satisfied nor Dissatisfied	4.3%
Somewhat Satisfied	60.9%
Very Satisfied	21.7%

Note. $N = 47$, $n = 46$, Percentages may not sum to 100% due to rounding

Research Question Three: Where are Nova Scotian psychologists/candidates registered turning for information on current psycho-educational assessment practices?

Descriptive statistics were run to determine what percentage of participating psychologists and candidates registered engage in different types of professional development (PD) and how often. Table 19 summarizes the sample's professional development activities.

Table 19

Professional Development (PD) Practices of NS Psychologists/Candidates Registered

Type of PD	*n*	Percentages (%)
Attend school board PD sessions	42	Never: 21.4% Occasionally: 16.7% Regularly: 47.6% Not Applicable: 14.3%
Attend academic conferences	42	Never: 0% Occasionally: 52.4% Regularly: 47.6% Not Applicable: 0%
Read peer-reviewed journal articles	42	Never: 4.8% Occasionally: 47.6% Regularly: 47.6% Not Applicable: 0%
Take formal classes in the area	41	Never: 43.9% Occasionally: 43.9% Regularly: 4.9% Not Applicable: 7.3%

Table 19 *(Continued)*

Type of PD	*n*	Percentages (%)
Read books by researchers in the area	42	Never: 0% Occasionally: 50.0% Regularly: 50.0% Not Applicable: 0%
Consult with other psychologists/professionals	42	Never: 0% Occasionally: 7.1% Regularly: 92.9% Not Applicable: 0%
Read literature published by the CPA, APA, or other professional organization	42	Never: 2.4% Occasionally: 42.9% Regularly: 54.8% Not Applicable: 0%
Other professional development	4	Never: 0% Occasionally: 25% Regularly: 25% Not Applicable: 50%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding

In order to examine whether professional development practices varied significantly by region, it was necessary to recode region into fewer levels, since cell sizes were too sparse to run a valid one-way Analysis of Variance (ANOVA). The decision was made to recode region into urban and rural areas based on general population. "Halifax Regional Municipality" and "Cape Breton Regional Municipality and/or Victoria County" were included in the urban group, and all

other regions were included in the rural group. With region reduced to two levels, Independent-Samples T Tests were run on the professional development and urban/rural variables. Levene's Test for Equality of Variances was non-significant, so equal variances were assumed. All results were non-significant except for the professional development variable, "Attend academic conferences," which was significant, $t(38)= 2.38$, $p < .05$. Specifically, those participants in the rural group ($M = 2.75$, $SD = 0.45$) were significantly more likely to attend academic conferences than those in the urban group ($M = 2.36$, $SD = 0.49$).

As with the region variable, it was necessary to recode the workplace demographic in order to run a one-way ANOVA with sufficient cell sizes. School boards were combined into a single "school board" level, "hospital" remained the same, and "private practice," "other," and "more than one workplace" were combined into a single level. A one-way ANOVA was run to determine whether professional development practices varied significantly by workplace. Welch exact tests were run for variables that did not meet the homogeneity of variance assumption. A significant difference was found between workplaces for the professional development variable, "read literature published by the CPA, APA, or another professional organization," $F(2, 35) = 3.48$, $p < .05$. Since the homogeneity of variance assumption was met, a Tukey HSD post hoc test was run. The Tukey resulted in a statistically significant difference between the means for Hospital ($M = 2.11$, $SD = 0.60$) and Private Practice/Other/Combination ($M = 2.73$, $SD = 0.47$).

A second professional development variable, "attend school board PD sessions," also varied significantly by workplace. Given that variances were not equal, the Welch exact test was used, $F_{Welch}(2, 9.75) = 20.37$, $p < .001$, and the Bonferroni post hoc test was run. As would be expected, the Bonferroni resulted in a statistically significant difference between the mean for School Board ($M = 2.83$, $SD = 0.38$) and the means for Hospital ($M = 1.43$, $SD = 0.54$) and Private Practice/Other/Combination ($M = 1.86$, $SD = 1.07$). No significant differences were

found for professional development practices by participant age, education level, or years as a psychologist/candidate register.

Research Question Four: How open are Nova Scotian psychologists/candidates registered to implementing newer, empirically supported approaches to psycho-educational assessment?

Descriptive statistics were run to summarize participants' responses to the individual items on the revised Aarons' Evidence-Based Practice Attitude Scale (EBPAS) (see Table 20). Refer back to Tables 2-5 for the means and standard deviations for each question in each subscale, and refer to Table 6 for means and standard deviation totals for each subscale and for the EBPAS total score. The average item score for the entire scale (M = 3.83, SD = 0.50) indicates that, on average, participants had attitudes in favour of evidence-based practices, the mean score falling between "To a Moderate Extent" and "To a Great Extent" on the scale. Mean item scores between "To a Moderate Extent" and "To a Great Extent" were also evident for the Appeal (M = 3.29, SD = 0.51), Openness (M = 3.95, SD = 0.71), and Requirements (M = 3.64, SD = 1.05) subscales. The mean item score on the Divergence scale was reverse coded (M = 4.53, SD = 0.50), indicating that, on average, participants reported attitudes that were divergent from embracing evidence-based practices "Not at All" or "To a Slight Extent."

Table 20

Individual Item Responses to the Revised Aarons' Evidence-Based Practice Attitude Scale

Item	Subscale	*n*	Percentages (%)
Like to use new LD assessment techniques	Openness	45	Not at all: 0% To a Slight Extent: 2.2% To a Moderate Extent: 24.4% To a Great Extent: 57.8% To a Very Great Extent: 15.6%
Willing to try specified, step-by-step procedure	Openness	45	Not at all: 0% To a Slight Extent: 2.2% To a Moderate Extent: 17.8% To a Great Extent: 51.1% To a Very Great Extent: 28.9%
Know better than academic researchers how to care for my clients	Divergence	44	Not at all: 43.2% To a Slight Extent: 29.5% To a Moderate Extent: 20.5% To a Great Extent: 6.8% To a Very Great Extent: 0%

Table 20 *(Continued)*

Item	Subscale	*n*	Percentages (%)
Willing to use new techniques developed by researchers	Openness	45	Not at all: 0% To a Slight Extent: 4.4% To a Moderate Extent: 15.6% To a Great Extent: 55.6% To a Very Great Extent: 24.4%
Research-based assessments not clinically useful	Divergence	44	Not at all: 81.8% To a Slight Extent: 15.9% To a Moderate Extent: 2.3% To a Great Extent: 0% To a Very Great Extent: 0%
Clinical experience more important than research-based assessment	Divergence	45	Not at all: 53.3% To a Slight Extent: 37.8% To a Moderate Extent: 8.9% To a Great Extent: 0% To a Very Great Extent: 0%

Table 20 *(Continued)*

Item	Subscale	*n*	Percentages (%)
Would not use specified, step-by-step approach	Divergence	45	Not at all: 88.9% To a Slight Extent: 6.7% To a Moderate Extent:4.4 % To a Great Extent: 0% To a Very Great Extent: 0%
Would try new technique even if very different	Openness	45	Not at all: 0% To a Slight Extent:11.1 % To a Moderate Extent: 24.4% To a Great Extent: 44.4% To a Very Great Extent: 20.0%
How likely to use if… intuitively appealing?	Appeal	37	Not at all: 0% To a Slight Extent: 8.1% To a Moderate Extent: 35.1% To a Great Extent: 29.7% To a Very Great Extent: 27.0%

Table 20 *(Continued)*

Item	Subscale	*n*	Percentages (%)
How likely to use if… it "made sense" to you?	Appeal	43	Not at all: 0% To a Slight Extent: 0% To a Moderate Extent: 20.9% To a Great Extent: 48.8% To a Very Great Extent: 30.2%
How likely to use if… it was required by your supervisor?	Requirements	43	Not at all: 11.6% To a Slight Extent: 11.6% To a Moderate Extent: 16.3% To a Great Extent: 46.5% To a Very Great Extent: 14.0%
How likely to use if… it was required by your agency or school board?	Requirements	43	Not at all: 4.7% To a Slight Extent: 18.6% To a Moderate Extent: 14.0% To a Great Extent: 44.2% To a Very Great Extent: 18.6%

Table 20 *(Continued)*

Item	Subscale	*n*	Percentages (%)
How likely to use if… it was required by your province?	Requirements	43	Not at all: 2.3% To a Slight Extent: 7.0% To a Moderate Extent: 20.9% To a Great Extent: 41.9% To a Very Great Extent: 27.9%
How likely to use if… it was being used by colleagues who were happy with it? *	Appeal	43	Not at all: 2.3% To a Slight Extent: 4.7% To a Moderate Extent: 23.3% To a Great Extent: 41.9% To a Very Great Extent: 27.9%
How likely to use if… you felt you had enough training to use it correctly?	Appeal	43	Not at all: 0% To a Slight Extent: 0% To a Moderate Extent: 9.3% To a Great Extent: 53.5% To a Very Great Extent: 37.2%

Table 20 *(Continued)*

Item	Subscale	*n*	Percentages (%)
How likely to use if… you felt you had enough time? **	Appeal	43	Not at all: 0% To a Slight Extent: 0% To a Moderate Extent: 16.3% To a Great Extent: 51.2% To a Very Great Extent: 32.6%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding
* Item removed from scale following factor analysis/reliability testing
** Item added to scale for current study

One-way ANOVAs were completed to determine whether EBPAS scores varied significantly by demographic variables. No significant results were found for EBPAS score by region, workplace, age, or education level. However, EBPAS score varied significantly by the number of years participants had been practicing as registered psychologists/candidates registered, $F(3, 30) = 6.54$, $p < .01$. The homogeneity of variance assumption was met, so the one-way ANOVA was interpreted and a Tukey HSD post hoc was run to examine the differences in EBPAS scores based on number of years practicing. Results showed that those participants who had been registered psychologists/candidates registered for 16 or more years ($M = 52.33$, $SD = 8.89$) had significantly lower total EBPAS scores than those who had been registered psychologists/candidates registered for zero to five years ($M = 65.13$, $SD = 5.71$) or six to ten years ($M = 64.57$, $SD = 6.83$).

Research Question Five: What are Nova Scotian psychologists'/candidates' registered attitudes regarding research-based practice, the discrepancy model, and response to intervention (RTI)?

Participants' opinions on specific learning disability assessment practices, use of intelligence tests, the IQ-achievement discrepancy model, and response to intervention are

summarized in Table 21. Learning disability diagnosis attitudes did not vary significantly by region (urban/rural), workplace (school board, hospital, private practice/other/combination), age, number of years as a psychologist/candidate register, or education level.

Table 21

NS Psychologists'/Candidates' Registered Attitudes about Learning Disability Diagnosis

Item	*n*	Percentages (%)
IQ test crucial for LD diagnosis	42	Not at all: 0% To a Slight Extent: 4.8% To a Moderate Extent: 16.7% To a Great Extent: 40.5% To a Very Great Extent: 38.1%
Full scale IQ score or GAI necessary for LD diagnosis	42	Not at all: 35.7% To a Slight Extent: 11.9% To a Moderate Extent: 23.8% To a Great Extent: 16.7% To a Very Great Extent: 11.9%
Presence of IQ-achievement discrepancy necessary for LD diagnosis	42	Not at all: 38.1% To a Slight Extent: 28.6% To a Moderate Extent: 19.0% To a Great Extent: 4.8% To a Very Great Extent: 9.5%

Table 21 *(Continued)*

Item	*n*	Percentages (%)
Presence of IQ-achievement discrepancy sufficient for LD diagnosis	42	Not at all: 76.2% To a Slight Extent: 14.3% To a Moderate Extent: 7.1% To a Great Extent: 0% To a Very Great Extent: 2.4%
Three-tiered RTI model can be practically implemented in public school systems	36	Not at all: 11.1% To a Slight Extent: 36.1% To a Moderate Extent: 33.3% To a Great Extent: 13.9% To a Very Great Extent: 5.6%
An evaluation of a student's prior RTI is necessary for LD diagnosis	41	Not at all: 22.0% To a Slight Extent: 22.0% To a Moderate Extent: 26.8% To a Great Extent: 24.4% To a Very Great Extent: 4.9%
An evaluation of a student's prior RTI is sufficient for LD diagnosis	41	Not at all: 65.9% To a Slight Extent: 26.8% To a Moderate Extent: 4.9% To a Great Extent:2.4 % To a Very Great Extent: 0%

Table 21 *(Continued)*

Item	*n*	Percentages (%)
Achievement scores and underachievement alone are sufficient for LD diagnosis	41	Not at all: 95.1% To a Slight Extent: 4.9% To a Moderate Extent: 0% To a Great Extent: 0% To a Very Great Extent: 0%

Note. $N = 47$, Percentages for a given variable may not sum to 100% due to rounding

Chapter IV: Discussion

Test and Procedure Use

The purpose of the present exploratory study was to investigate the current psycho-educational assessment practices, preferences, and attitudes of Nova Scotian registered psychologists and candidates registered. Research questions one and two focused on participants' use of and preferences for various psycho-educational tests and procedures. Results showed that the majority of psychologists/candidates registered in the province take an eclectic approach to psycho-educational assessment, using a combination of tests or procedures to determine the presence or absence of a learning disability. The majority of those who participated use interviews, reviews of clients' cumulative education files, cognitive and achievement test batteries, and tests of specific cognitive processes (e.g., visual-motor processing) always or almost always. In addition, the majority at least occasionally use observations, response to intervention methods, IQ-achievement discrepancy approaches, CHC-based assessment, and evaluation of personality, behavioural, and emotional functioning, with and without Achenbach or Conners checklists. This finding is in line with Woods and Farrell's (2006) study, where they found that educational psychologists in England and Wales were using a broad range of assessment techniques to investigate learning difficulties.

Of the three major approaches to assessment measured in this study, IQ-achievement discrepancy analysis was reported to be used the most often, followed by CHC-based evaluation of cognitive processes, and then response to intervention. Nearly half of all psychologists/candidates registered reported using the discrepancy approach always or almost always (48.9%), and another 23.4% reported using it occasionally. The continued prevalence of the discrepancy method in Nova Scotia is not surprising, given similar findings across North America over the past several years (Gallego et al., 2006; Kozey & Siegel, 2008; Warner et al.,

2002). Results also indicated that CHC-based information processing methods are fairly prevalent among those doing psycho-educational assessments in Nova Scotia, with 38.3% of respondents reporting that they use CHC-based methods always or almost always and 17% using them occasionally. Formal response to intervention (RTI) methods are not reported to be used as often as discrepancy and information processing approaches but are still being used at least occasionally by about half of the psychologists/candidates registered who conduct learning disability assessment in Nova Scotia. Anecdotal responses indicated that some practitioners are not familiar with the RTI model, which is likely to contribute to less frequent use across the province (see Appendix 5 for anecdotal responses). These results support Kozey and Siegel's (2008) study, where they found that RTI, while supported by Nova Scotia's provincial learning disability policy, is not common practice.

Psychologists'/candidates' registered test and procedure use did not vary significantly from region to region, indicating that for regions adequately represented by the sample, the basic tests and procedures used for psycho-educational assessment are fairly similar across the province. One procedure, playground observation use, did vary significantly between those working in School Boards D and E and those working in a hospital setting, with those in a school setting using playground observations more often. This finding is not surprising since those who work directly in school settings have easier access to the in-school environment than do those working in external settings, such as hospitals.

While participants' use of partial achievement batteries varied by age, it is difficult to speculate as to why this result was found. Those in the younger 34 years and under group were less likely to use partial achievement batteries always or almost always than those in the 35 to 44 year group and were more likely to do so occasionally. Since no differences were found in test and procedure use by years practicing, it is unlikely that this finding is due to the experiences of

a particular school cohort or due to years of experience in the field. It could be that younger practitioners do not feel as comfortable using only part of an achievement battery whereas practitioners in the middle age group are more confident making those types of assessment decisions. However, it is not clear from this study why this difference exists.

Several differences were found for test and procedure use by education level. Some of these differences might be explained by workplace. While many of the participants who have masters degrees specialized in school psychology and are employed by school boards, most of those with doctoral degrees reported working for hospitals, in private practice, or for other organizations outside of the school boards. Therefore, it is not surprising that those with masters level education were more likely to report using teacher interviews and playground observations occasionally or always/almost always more often than those with doctorates. However, other findings by education level are not as easy to explain. One interesting finding is that those Nova Scotian psychologists/candidates registered with masters level education were more likely to use CHC-based assessment methods than were those with doctorates. Furthermore, for those who reported using CHC-based methods rarely or never, those with masters degrees usually reported that this was due to a lack of sufficient training and resources, whereas those with doctoral degrees more often stated that this was due to not liking the technique. It is possible that CHC-based theory, assessment techniques, and materials are being promoted in school psychology masters programs and/or by some school boards. Differences were also found in the use of Achenbach/Conners parent and teacher forms. Specifically, those with doctorates were more likely to report using the forms always or almost always, while those with masters degrees were most likely to use the forms occasionally. This difference may be explained by the more frequent contact school-based psychologists have with both teachers and parents in the school setting. Information may be more readily available through casual conversations and formal

interviews for masters-level, primarily school-based researchers than it is for those with doctorates who work primarily outside of the school environment, possibly necessitating the need for more frequent form use for some practitioners. However, there could be some school-based psychologists with doctorates as well as many external-to-school psychologists with masters level education, so alternate explanations for the differences in test and procedure use by education level should also be considered.

Those participants who reported that they use a full or partial cognitive assessment battery were asked to specify which one they use most often. Weschler intelligence scales were used the most often, followed by the Woodcock Johnson III (WJIII). This did differ significantly by workplace, with participants from one school board using WJIII significantly more than other school boards. It is likely that test availability, adequate test training, and school board support and/or requirements for use of a particular test are major contributing factors in which test practitioners choose to use. Anecdotal responses frequently indicated that some practitioners would switch to a different cognitive battery (generally the WJIII) if resources and training were readily available through their workplaces.

Test and Procedure Preferences

When asked about their preferences for incorporating various tests and procedures into their psycho-educational assessment repertoire, psychologists and candidates registered once again supported a widely varied assessment approach. More than half of participants reported using and preferring interview and observation techniques, cumulative file reviews, cognitive and achievement batteries, tests of individual cognitive processes, and evaluation of personality, behavioural, and emotional functioning, with and without Achenbach or Conners checklists. This is again in line with Woods and Farrell's (2006) research and reflects an eclectic approach

to LD diagnosis, as promoted by well-known learning disability researchers, Flanagan, Ortiz, Alfonso, and Dynda (2006).

Preferences for the three major assessment approaches measured in this study was in sharp contrast to actual use. When combining "use and prefer" and "do not use but would prefer to use" options, CHC-based assessment was the most preferred, followed by response to intervention (RTI), and then the discrepancy method. While the "use but do not prefer to use" result was negligible for CHC-based assessment and RTI, it was chosen by 31.8% of participants for the discrepancy method. Similarly, while nobody chose the "do not use but would prefer to use with sufficient training, resources and support" for the discrepancy method, this option was chosen by 41.9% of participants for RTI and 35.6% of participants for CHC-based assessment. These results indicate a sense of dissatisfaction with the commonly used discrepancy model, along with a lack of resources, training, and support for using preferred RTI and CHC-based assessment models. This lends further support to Kozey and Siegel's (2008) assertion that "Canadian policy is shifting away from an IQ-achievement model of LD, yet it remains reliant on it in absence of a clearly established alternative definition or approach" (p. 169).

Participants were asked to select any tests or procedures that they do not currently use but would definitely use if they had sufficient resources, training, and support. This question was asked in an attempt to differentiate between procedures practitioners believe they might prefer to use and those they think they would actually use if given the opportunity. The top five tests and procedures that practitioners reported that they did not use but would definitely use with sufficient support included the following: formal evaluation of a child's prior response to intervention (selected by 27.7% of the sample), evaluation of specific cognitive processes and achievement using methods derived from CHC theory (23.4%), observe child in classroom (19.1%), evaluation of personality, behavioural, and emotional functioning (excluding

Achenbach and Conners checklists) (19.1%), and review child's cumulative file (17.0%). Once again, RTI and CHC-based assessment methods are highlighted as techniques that practitioners would like to implement but feel they lack sufficient resources, training, and/or support to do so. The other highly rated items in this section—classroom observations, evaluation of personality, behavioural, and emotional functioning, and reviewing cumulative files—indicate additional areas where some practitioners feel they could use more resources, training, and support. Classroom observations and cumulative file reviews are particularly challenging for psycho-educational practitioners who are not based in the school setting and who therefore do not have easy access to classrooms or private school documents.

The only test or procedure preference to vary significantly by geographic region was parent interview, which varied between two regions. While an overwhelming majority of those from Region B use and prefer parent interviews, the great majority from Region D reported that they do not use but would prefer to use parent interviews if they had the appropriate support. Without identifying and studying each region in greater detail, it is difficult to determine why this difference may exist. However, it is possible that practitioners in Region B have easier access to or greater communication opportunities with parents than those in Region D, whether it be due to school board/agency rules, differences in referral systems, or differences in expectations and training from region to region.

Several test and procedure preferences were found to vary by workplace. Generally, classroom and playground observations were "used and preferred" by practitioners based in school boards and not used but would be preferred by those working in hospitals. These results make sense given the easy access school-based practitioners have to children in the school environment, and it is notable that in both cases, classroom and playground observations are, or would be, preferred. With regard to physical education observations, practitioners from different

school boards were split between using/preferring, using/not preferring, and not using/not preferring the procedure. Hospital-based practitioners were split evenly between not using/preferring and not using/not preferring physical education observations. Differences between the school boards and hospital may still be explained primarily by ease of access to children in the school environment. However, it is more difficult to speculate as to why practitioner preferences for phys-ed observations differ from board to board. It is likely that a combination of training, resources, and expectations within a given board impacts practitioners' preferences for different routine assessment procedures.

Significant differences in test/procedure preference by workplace also resulted for partial cognitive assessment and CHC-based assessment methods. While those from School Boards C and F reported using and preferring partial cognitive assessment, those from School Board E primarily reported neither using nor preferring to use partial cognitive assessment. Once again, it is likely that a combination of specific training, board resources, and board rules and expectations are responsible for the differences in specific preferences between those from different school boards. CHC-based assessment preferences varied between School Board E, where most practitioners reported using and preferring the method, and hospital, where most practitioners reported that they did not use but would prefer to use the method with sufficient support. CHC-based assessment preferences also varied between School Board E and private practice/other/combined, where most practitioners reported that they did not use and would not prefer to use CHC-based assessment practices. It is possible that practitioners who work for School Board E have been exposed to CHC theory and cross battery approaches through board-based professional development opportunities or in their graduate programs.

Three tests and procedure preferences—teacher interview, cumulative file review, and a test of phonological processing—varied significantly by education level. In all cases, a higher

percentage of those with masters degrees responded that they use and prefer each test/procedure, while a higher percentage of those with doctorates responded that they did not use but would prefer to use each method. Again, these results may well be reflective of the most common workplaces of those with different levels of education. While most respondents who reported working for school boards held masters degrees, many of those who reported working in non-school based workplaces held doctorates. Both teacher interviews and cumulative file reviews may be more convenient for psychologists/candidates registered who work directly in the school system. It is also possible that many of those working for the school boards have work and educational backgrounds in which they have been exposed to a specific test(s) of phonological processing and have become comfortable with its administration and interpretation.

A difference was also found between the 34 and under and 35-44 age groups with respect to preference for a test of phonological processing, with a higher percentage of the younger age group reporting that they use and prefer such a test. Once again, since this difference was not found for number of years practicing psychology, it is not easily explained by work experience or by the educational background of a particular graduate school cohort. It is difficult to speculate as to why this age difference in preference for a phonological processing test exists without further research.

After describing their use of and preferences for different tests and procedures, practitioners were asked to select their overall satisfaction with their current approach to psycho-educational assessment. While several participants reported being very satisfied with their current assessment approach (21.7%), the majority reported being only somewhat satisfied (60.9%), and some reported being neither satisfied nor dissatisfied (4.3%) and even somewhat dissatisfied (13.0%). These results indicate that for the majority of psychologists and candidates registered who perform psycho-educational assessments in Nova Scotia, satisfaction levels could

be improved. Analyses of the anecdotal responses provided indicated that practioners may be more satisfied with their assessment methods if they had access to a greater repertoire of testing materials, had more training in non-discrepancy based assessment approaches in their graduate programs, and had more time and/or money in order to learn and implement desired assessment practices.

Professional Development Practices

Participants were asked about their professional development (PD) practices in order to determine where they may be getting information about new research in the learning disabilities field and guidance on psycho-educational assessment techniques. The first variable measured, "attend school board PD sessions," is unique in that it applies almost exclusively to those psychologists and candidates registered employed by school boards. For this reason, a large number of participants selected either "never" or "not applicable" for this option. However, nearly half of participants, presumably those hired by school boards, indicated that they attend school board PD sessions regularly, and several attend occasionally.

Over half of all participants reported reading books by researchers in the area, consulting with other psychologists/professionals, and reading literature published by the CPA, APA, or other professional organizations on a regular basis. Other common practices used at least occasionally by more than half of all participants include attending academic conferences and reading peer-reviewed journal articles. Taking formal classes in the area was also fairly common, with 4.9% of participants doing so regularly and 43.9% doing so occasionally.

Professional development activities varied by region, with those in rural areas being significantly more likely to attend academic conferences than those in urban parts of the province. It is conceivable that this difference may be due in part to the greater number of psychologists working for school boards and/or other agencies in urban areas. Rural boards and

agencies may be more likely to cover the costs of conferences for a small group of practitioners, while larger agencies in urban areas may find it difficult to send several employees to an academic conference.

Professional development practices also varied by workplace. Not surprisingly, those participants who worked for school boards were significantly more likely than others to attend school board-based professional development sessions. It was also found that those practitioners in the "private practice/other/combination" group were significantly more likely to read literature published by the CPA, APA, and other professional organizations than were those working in a hospital setting. Since most of those in the "combination" group worked in private practice (in addition to another workplace), private practitioners make up the majority of this group. It is possible that those working exclusively in private practice may rely more on literature published by organizations due a lack of required, agency-based professional development, as might be worked into the regular PD routine of a hospital-based practitioner. In addition, since private practioners who do not also work in a school board or hospital are likely to have fewer psychology colleagues in their workplace, they may rely more on professional literature to keep them up to date on the latest research and industry trends.

Attitudes Toward Evidence-Based Practice

Results from the revised Aarons' Evidence-Based Practice Attitudes Scale indicate that psychologists and candidates registered who do psycho-educational assessment in Nova Scotia generally support evidence-based practice to a moderate-to-high degree. Subscale scores indicate that NS practitioners are moderately to very likely to adopt an evidence-based practice if it appeals to them (e.g., "how likely would you be to adopt it if: ..... it was intuitively appealing?") and/or if it is required by their supervisor, agency, or province. Practitioners also recorded high openness scores, indicating that they are open to novel research-based practices

(e.g., "I would try a new assessment technique/intervention even if it were very different from what I am used to doing."), and they had very low divergence scores, indicating that they do not hold strong feelings or opinions against implementing evidence-based techniques (e.g., "Clinical experience is more important than using research-based assessment techniques/interventions"). These findings suggest that psychology practitioners in Nova Scotia are generally quite open to learning about and implementing evidence-based practices. This is in line with the test and procedure preferences indicated by participants, which were largely evidence-based (e.g., a preference for CHC-based/cross battery assessment approaches) (Fiorello & Primerano, 2005). However, it is not entirely in line with NS psychologist/candidate registered current test and procedure use, where the problematic discrepancy analysis continues to dominate (D'Angiulli & Siegel, 2003; Flanagan et al., 2006; Fletcher et al., 1994; Hettleman, 2003; Jiménez et al., 2009; Siegel, 1992; Siegel & Himel, 1998; Stanovich, 1999, 2005; Vellutino, Scanlon, & Lyon, 2000; Warner et al., 2002). Anecdotal responses indicate that a lack of resources, training, and support is contributing to the continued use of non-evidence based practices in the learning disability field, despite preferences for and positive attitudes toward research-based techniques (see Appendix 5).

Attitudes toward evidence-based practice varied by number of years practicing, with those who had been registered psychologists/candidates registered for zero to five and six to ten years scoring significantly higher revised EBPAS scores than those who had been for 16 or more years. This finding is supported by Aarons' (2004) finding that mental health practioners at the interning stage in their career scored higher on the EBPAS total, as well as the Appeal and Openness subscales, and lower on the Divergence subscale, than those who had been practicing for many years. This finding suggests that those practitioners at earlier stages of their careers

may be more open to adopting novel practices than those who have had many years to establish their psycho-educational assessment technique.

Learning Disability Diagnostic Attitudes

The final section of the current study measured participants attitudes regarding intelligence test use and the IQ-achievement discrepancy method, reponse to intervention, and use of achievement scores alone as a definitive LD diagnostic technique. While the great majority of participants indicated that they felt giving an intelligence test is crucial in determining the presence of a learning disability, practitioner responses were split as to whether or not a full-scale IQ score or general ability index score were crucial for LD diagnosis. Practitioner opinions were also split regarding whether or not an IQ-achievement discrepancy is necessary for LD diagnosis. However, the majority selected either "not at all" or "to a slight extent," indicating that, for most practitioners, IQ-achievement discrepancy is not a key necessity in their psycho-educational assessment practice. The great majority of participants responded that an IQ-achievement discrepancy is not sufficient for an LD diagnosis, indicating that few psychological professionals in Nova Scotia rely entirely on discrepancy in diagnosing learning disabilities. Still, a small percentage of practitioners did respond that an IQ-achievement discrepancy is sufficient for LD diagnosis, indicating that not all practitioners have embraced more novel, research-based psycho-educational assessment practices (D'Angiulli & Siegel, 2003; Flanagan et al., 2006; Fletcher et al., 1994; Hettleman, 2003; Jiménez et al., 2009; Siegel, 1992; Siegel & Himel, 1998; Stanovich, 1999, 2005; Vellutino, Scanlon, & Lyon, 2000; Warner et al., 2002).

Participant attitudes regarding response to intervention (RTI) were varied. When asked whether they thought RTI could be practically implemented in schools, approximately one third of those who responded believed this was possible "to a slight extent" or "to a moderate extent."

Of the remaining third, several responded that RTI could be practically implemented "not at all" or "to a great extent," and few believed it could be practically implemented "to a very great extent." When asked whether they believed a formal evaluation of RTI was necessary to determine the existence of a learning disability, responses were almost uniformly split across all of the response options except for "to a very great extent," which was not generally selected. The majority of participants selected "not at all" when asked whether they believed an evaluation of RTI was sufficient for LD diagnosis, a belief which is supported by researchers who have reasoned that RTI is necessary, but not sufficient, for LD diagnosis (Kavale et al., 2006). Some of the anecdotal responses indicated that some practitioners are not familiar with the RTI model. It is possible that a lack of understanding of the intricacies of the model may have contributed to contrasting opinions about RTI among participants.

Learning disability assessment models based exclusively on achievement scores were not embraced by NS psychology practitioners, with an overwhelming majority selection "not at all" to the statement, "achievement scores and underachievement alone are sufficient for LD diagnosis." This is encouraging, since many important aspects of LD assessment, including analysis of exclusionary factors, consideration of processing deficits, prior response to intervention, and evaluation of interference with functioning, would be neglected if practitioners were only evaluating basic academic skills (Flanagan et al., 2006).

Implications for Theory and Practice

This study adds to the current literature with its Nova Scotian focus and its inclusion of a measure of practitioner attitudes toward evidence-based practice with regard to learning disability diagnosis. The study also has practical applications for those who conduct psycho-educational assessments, school boards, hospitals, private practices, the province of Nova Scotia, and those involved with administering and teaching in applied psychology graduate programs.

Findings indicated that, on the whole, psychologists and candidates registered in Nova Scotia are open to implementing evidence-based psycho-educational assessment practices and that they prefer tests and procedures with a strong research base, such as information processing-based assessment methods (Fiorello & Primerano, 2005), to those with less research support, such as the IQ-achievement discrepancy analysis (e.g., D'Angiulli & Siegel, 2003). However, due to limitations in test resources, training, time, money, and support, psychologists and candidates registered are not always using learning disability assessment practices that match their research-based preferences and attitudes. As a result, the majority of practioners are only somewhat satisfied with their current approach to psycho-educational assessment, and several are somewhat dissatisfied.

These results have implications for school boards, hospitals, and private practice organizations. Specifically, a dialogue can be opened between agency officials and their employed psychologists and candidates registered about best practices, preferred practices, and what tools, training opportunities, and supports could be put in place to help implement research-based practices and improve practitioner satisfaction. Specifically, results from this study indicate that practitioners are interested in learning more about CHC/cross-battery assessment techniques and response to intervention (RTI) and would benefit from training and test resources that support those approaches.

This research also has implications for those who co-ordinate and teach in applied psychology graduate programs. Through academic research and publishing opportunities, graduate school faculty have a great deal of access to information about best practices and evidence-based psycho-educational assessment. Yet, results of the current study indicate that many practioners feel that they have inadequate training in research-based assessment techniques. A solid theoretical and practical focus on best practices in learning disability

assessment methods should be a major focus in school psychology education and related graduate fields.

For practitioners, the greatest implication of this research may be in the area of best practice advocacy in the workplace. Nova Scotian psychology practitioners who are not entirely satisfied with their current approach to assessment can now be more aware that other local practitioners have similar concerns and are open to change. Practitioners may choose to take this information and use it to advocate for evidence-based change in the workplace, leading to further adoption of best practices in the province. In addition, those psychologists and candidates registered who have been concerned with current psycho-educational assessment practices in the region may be encouraged to know that the majority of practitioners are embracing an eclectic, thorough approach to LD assessment, including a wide variety of interviewing, observation, and testing techniques, and very few practitioners are relying entirely on IQ-achievement discrepancy analysis to determine the presence or absence of a learning disability. That said, reliance on the discrepancy model continues.

Finally, this study has implications for the province of Nova Scotia. When asked about implementing evidence-based assessment practices, the majority of participants indicated that they would make use of a research-based technique if it were required by their province. According to Kozey and Siegel (2008), current Nova Scotian learning disability policy is heavily based in the IQ-achievement discrepancy model, and while response to intervention methods are presented in written policy, they are not common practice. In addition, Kozey and Siegel note that Nova Scotian policy leads to a "wait to fail" approach where children are required to fall multiple grade levels behind in school before they are eligible to receive severe learning disability supports. With the knowledge that practioners attitudes are linked to provincial policy,

the province has a responsibility to the learning disability community to revise policy to reflect best practices and to enforce research-based policies at the school board and hospital levels.

Limitations and Future Research Directions

The current study presents certain limitations that should be considered in evaluating the findings and may lead to questions for future research study design. The most notable caveat to this research is the small sample size. Although drawing from a relatively small population (those psychologists and candidates registered who conduct psycho-educational assessments in Nova Scotia), this sample was particularly small, consisting of only 47 practitioners. In addition to the overall small sample, some regions were represented well (e.g., the Halifax Regional Municipality), while others were represented very little or not at all (e.g., Guysborough, Antigonish, Inverness, and Richmond County). Therefore, caution should be used when interpreting and generalizing these results to the rest of psychology practitioners in Nova Scotia. In the future, it may be beneficial to include psychologists and candidates registered from neighboring provinces in similar research and/or to re-advertise the current study in an attempt to improve response rates.

Another caveat of the current study is related to the voluntary nature of participation. Volunteer bias occurs when those who choose to participate in a study are, as a group, significantly different from those who do not (Taylor, Cahn-Weiner, & Garcia, 2009). In order to participate in this study, practioners had to read the introductory email, follow a link to the online questionnaire, and devote several minutes to completing the survey. It is possible that those practitioners who are most concerned about local learning disability assessment practices were more likely to participate than those who are apathetic or very satisfied with their current practices. It is possible that this volunteer bias may impact the generalizability of the study. In the future, it may be useful for school boards and other organizations to record the tests and

procedures being used by their employees to diagnose learning disabilities to ensure that information is representative of the population.

The fact that the current study relied exclusively on self-report measures presents an additional limitation. Self-report bias occurs due to research participants' natural inclination to provide socially desirable responses to research questions (Donaldson & Grant-Vallone, 2002). Participants may have felt inclined to answer questions in a way they felt would please the researcher (e.g., by claiming to have more positive attitudes toward evidence-based practices than they actually do). However, research methods that do not rely on self-report, such as direct observation of practitioners, would present several ethical and practical dilemmas. A better direction for future research may be to rely on self-report options that leave less room for bias, such as having participants record daily logs of all of the tests and procedures they have used for a given period of time.

An important note for this non-experimental research design is that one cannot draw causal conclusions from the results. Although many variables differed between groups of participants based on demographic factors, one cannot say, for example, that practicing in a rural area causes psychologists to attend more academic conferences. However, it is useful to reason about why those participants working in rural areas might have been more likely to report attending academic conferences on a regular basis than those in urban settings.

Given the implications of this study for school boards, hospitals, and other organizations that employ those who do learning disability assessments, it may be beneficial for researchers to focus future studies on those who are in charge of administering testing resources, planning professional development programs, and writing learning disability policy at the organizational and provincial levels. Gathering information about the decision making process administrators go through to determine what resources and training to provide practitioners may help to better

understand why some organizations are not supporting practitioners' preferences for best practices in psycho-educational assessment. With that information in hand, researchers, practitioners, and administrators may be able to work together to come up with ways to meet the needs of the learning disability community while being cognizant and respectful of the time, money, and logistical constraints of organizations.

Conclusions

The purpose of the current study was to examine the current and preferred psycho-educational assessment practices of registered psychologists and candidates registered in Nova Scotia. Practitioners' satisfaction with current approaches and attitudes toward adopting evidence-based practices were also examined. The current study fills a gap in learning disability assessment research by focusing on a Nova Scotian population and by measuring not only current practices but also psychologists' and candidates' registered attitudes toward the implementation of research-based methods in their assessment practices.

Results revealed that the majority of psychologists and candidates registered in Nova Scotia hold positive attitudes about evidence-based practice, use thorough and well-rounded assessment techniques, and are open to implementing additional research-based techniques into their current assessment approach. However, due to a lack of sufficient resources, training, and support at the provincial and organizational levels, many practitioners find it difficult to implement their preferred, research-based practices. This has resulted in most practitioners feeling only somewhat satisfied, and others feeling somewhat dissatisfied, with their current approach to psycho-educational assessment.

The current study has implications for practitioners, school boards, hospitals, private practice organizations, graduate school programs, and provincial policy makers. Researchers may wish to focus future research at the organizational level in order to determine what steps

must be taken to provide willing psychologists and candidates registered with the materials, training, and administrative support required to implement their preferred practices—best practices.

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Appendix 1: Canadian Learning Disabilities Definition

Official Definition of Learning Disabilities
Adopted by the Learning Disabilities Association of Canada
January 30, 2002

Learning Disabilities refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency.

Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).

Learning disabilities range in severity and may interfere with the acquisition and use of one or more of the following:

- oral language (e.g. listening, speaking, understanding);
- reading (e.g. decoding, phonetic knowledge, word recognition, comprehension);
- written language (e.g. spelling and written expression); and
- mathematics (e.g. computation, problem solving).

Learning disabilities may also involve difficulties with organizational skills, social perception, social interaction and perspective taking.

Learning disabilities are lifelong. The way in which they are expressed may vary over an individual's lifetime, depending on the interaction between the demands of the environment and the individual's strengths and needs. Learning disabilities are suggested by unexpected academic under-achievement or achievement which is maintained only by unusually high levels of effort and support.

Learning disabilities are due to genetic and/or neurobiological factors or injury that alters brain functioning in a manner which affects one or more processes related to learning. These disorders are not due primarily to hearing and/or vision problems, socio-economic factors, cultural or linguistic differences, lack of motivation or ineffective teaching, although these factors may further complicate the challenges faced by individuals with learning disabilities. Learning disabilities may co-exist with various conditions including attentional, behavioural and emotional disorders, sensory impairments or other medical conditions.

For success, individuals with learning disabilities require early identification and timely specialized assessments and interventions involving home, school, community and workplace settings. The interventions need to be appropriate for each individual's learning disability subtype and, at a minimum, include the provision of:

- specific skill instruction;
- accommodations;
- compensatory strategies; and
- self-advocacy skills.

Appendix 2: CHC Broad and Narrow Abilities

Cattell-Horn-Carroll (CHC) Broad and Narrow Cognitive Ability Definitions

(3rd draft; 3-11-09; Kevin McGrew)

Fluid reasoning (*Gf*): The use of deliberate and controlled mental operations, often in a flexible manner, to solve novel problems that cannot be performed automatically. Mental operations often include drawing inferences, concept formation, classification, generalization, generating and testing hypothesis, identifying relations, comprehending implications, problem solving, extrapolating, and transforming information. Inductive and deductive reasoning are generally considered the hallmark indicators of *Gf*. *Gf* has been linked to cognitive complexity which is typically defined as the greater use of a wide and diverse array of elementary cognitive processes during performance. Historically is often referred to as fluid intelligence.

General Sequential (deductive) Reasoning (RG): Ability to start with stated assertions (rules, premises, or conditions) and to engage in one or more steps leading to a problem solution. The processes are deductive as evidenced in the ability to reason and draw conclusions from given general conditions or premises to the specific. Often known as hypothetico-deductive reasoning.

Induction (I): Ability to discover the underlying characteristic (e.g., rule, concept, principle, process, trend, class membership) that underlies a specific problem or a set of observations, or to apply a previously learned rule to the problem. Reasoning from specific cases or observations to general rules or broad generalizations. Often requires the ability to combine separate pieces of information in the formation of inferences, rules, hypotheses, or conclusions.

Quantitative Reasoning (RQ): Ability to inductively (I) and/or deductively (RG) reason with concepts involving mathematical relations and properties.

Piagetian Reasoning (RP): Ability to demonstrate the acquisition and application (in the form of logical thinking) of cognitive concepts as defined by Piaget's developmental cognitive theory. These concepts include seriation (organizing material into an orderly series that facilitates understanding of relations between events), conservation (awareness that physical quantities do not change in amount when altered in appearance), classification (ability to organize materials that possess similar characteristics into categories), etc.

Speed of Reasoning (RE): Speed or fluency in performing reasoning tasks (e.g., quickness in generating as many possible rules, solutions, etc., to a problem) in a limited time. Also listed under *Gs*.

Comprehension-knowledge (*Gc*): The knowledge of the culture that is incorporated by individuals vis-a-vis a process of acculturation. *Gc* is typically described as a person's breadth and depth of acquired knowledge of the language, information and concepts of a specific culture, and/or the application of this knowledge. *Gc* is primarily a store of verbal or language-based declarative (knowing *what*) and procedural (knowing *how*) knowledge acquired through the investment of other abilities during formal and informal educational and general life experiences. Historically is often referred to as crystallized intelligence.

Language Development (LD): General development or understanding and application of words, sentences, and paragraphs (not requiring reading) in spoken native language skills to express or communicate a thought or feeling.

Lexical Knowledge (VL): Extent of vocabulary (nouns, verbs, or adjectives) that can be understood in terms of correct word (semantic) meanings. Although evidence indicates that vocabulary knowledge is a separable component from LD, it is often difficult to disentangle these two highly connected and corrected abilities in research studies.

Listening Ability (LS): Ability to listen and understand the meaning of oral communications (spoken words, phrases, sentences, and paragraphs). The ability to receive and understand spoken information.

General (verbal) Information (K0): Range of general stored knowledge (primarily verbal).

Information about Culture (K2): Range of stored general cultural knowledge (e.g., music, art, literature).

Communication Ability (CM): Ability to speak in "real life" situations (e.g., conversation, lecture, group participation) in a manner that transmits ideas, thoughts, or feelings to one or more individuals.

Oral Production and Fluency (OP): More specific or narrow oral communication skills than reflected by CM. Poorly defined by current research.

Grammatical Sensitivity (MY): Knowledge or awareness of the distinctive features and structural principles of a native language that allows for the construction of words (morphology) and sentences (syntax). Not the skill in applying this knowledge.

Foreign Language Proficiency (KL): Similar to Language Development but for a foreign language.

Foreign Language Aptitude (LA): Rate and ease of learning a new language.

General (domain-specific) knowledge (*Gkn*): The breadth, depth and mastery of a person's acquired knowledge in a specialized (demarcated) subject matter or discipline domains that typically do not represent the general universal experiences of individuals in a culture (*Gc*). *Gkn* reflects deep specialized knowledge domains developed through intensive systematic practice and training (over an extended period of time) and the maintenance of the knowledge base through regular practice and motivated effort (a.k.a., expertise).

Knowledge of English a Second Language (KE): Degree of knowledge of English as a second language.

Knowledge of Signing (KF): Knowledge of finger-spelling and signing (e.g., ASL) used in communication with the deaf or hard of hearing.

Skill in Lip-reading (LP): Competence in ability to understand communication from others by watching the movement of their mouths and expressions (lip reading). Also known as speech reading.

Geography Achievement (A5): Range of geography knowledge (e.g., capitals of countries).

General Science Information (K1): Range of stored scientific knowledge (e.g., biology, physics, engineering, mechanics, electronics).

Mechanical Knowledge (MK): Knowledge about the function, terminology and operation of ordinary tools, machines, and equipment. Since these factors were identified in research prior to the information/technology explosion, it is unknown if this ability generalizes to the use of modern technology (e.g., faxes, computers, internet).

Knowledge of Behavioral Content (BC): Knowledge or sensitivity to nonverbal human communication/interaction systems (beyond understanding sounds and words; e.g., facial expressions and gestures) that communicate feelings, emotions, and intentions, most likely in a culturally patterned style.

Visual processing (*Gv*): The ability to generate, store, retrieve, and transform visual images and sensations. *Gv* abilities are typically measured by tasks (viz., figural or geometric stimuli) that require the perception and transformation of visual shapes, forms, or images and/or tasks that require maintaining spatial orientation with regard to objects that may change or move through space.

Visualization (Vz): The ability to apprehend a spatial form, object, or scene and match it with another spatial object, form, or scene with the requirement to rotate it (one or more times) in two or three dimensions. Requires the ability to mentally imagine, manipulate or transform objects or visual patterns (without regard to speed of responding) and to "see" (predict) how they would appear under altered conditions (e.g., parts are moved or rearranged). Differs from Spatial Relations (SR) primarily by a de-emphasis on fluency.

Spatial Relations (SR): Ability to rapidly perceive and manipulate (mental rotation, transformations, reflection, etc.) visual patterns or to maintain orientation with respect to objects in space. SR may require the identification of an object when viewed from different angles or positions.

Closure Speed (CS): Ability to quickly identify a familiar meaningful visual object from incomplete (e.g., vague, partially obscured, disconnected) visual stimuli, without knowing in advance what the object is. The target object is assumed to be represented in the person's long-term memory store. The ability to "fill in" unseen or missing parts in a disparate perceptual field and form a single percept.

Flexibility of Closure (CF): Ability to identify a visual figure or pattern embedded in a complex distracting or disguised visual pattern or array, when knowing in advance what the pattern is. Recognition of, yet the ability to ignore, distracting background stimuli is part of the ability.

Visual Memory (MV): Ability to form and store a mental representation or image of a visual shape or configuration (typically during a brief study period), over at least a few seconds, and then recognize or recall it later (during the test phase).

Spatial Scanning (SS): Ability to quickly and accurately survey (visually explore) a wide or complicated spatial field or pattern and identify a particular configuration (path) through the visual field. Usually requires visually following the indicated route or path through the visual field.

Serial Perceptual Integration (PI): Ability to identify (and typically name) a pictorial or visual pattern when parts of the pattern are presented rapidly in serial order (e.g., portions of a line drawing of a dog are passed in sequence through a small "window").

Length Estimation (LE): Ability to accurately estimate or compare visual lengths or distances without the aid of measurement instruments.

Perceptual Illusions (IL): The ability to resist being affected by the illusory perceptual aspects of geometric figures (i.e., not forming a mistaken perception in response to some characteristic of the stimuli). May best be thought of as a person's "response tendency" to resist perceptual illusions.

Perceptual Alternations (PN): Consistency in the rate of alternating between different visual perceptions.

Imagery (IM): Ability to mentally depict (encode) and/or manipulate an object, idea, event or impression (that is not present) in the form of an abstract spatial form. Separate IM level and rate (fluency) factors have been suggested.

Auditory processing (*Ga*): Abilities that depend on sound as input and on the functioning of our hearing apparatus. A key characteristic is the extent an individual can cognitively control (i.e., handle the competition between signal and noise) the perception of auditory information. The *Ga* domain circumscribes a wide range of abilities involved in the interpretation and organization of sounds, such as discriminating patterns in sounds and musical structure (often under background noise and/or distorting conditions) and the ability to analyze, manipulate, comprehend and synthesize sound elements, groups of sounds, or sound patterns.

Phonetic Coding (PC): Ability to code, process, and be sensitive to nuances in phonemic information (speech sounds) in short-term memory. Includes the ability to identify, isolate, blend, or transform sounds of speech. Frequently referred to as phonological or phonemic awareness.

Speech Sound Discrimination (US): Ability to detect and discriminate differences in phonemes or speech sounds under conditions of little or no distraction or distortion.

Resistance to Auditory Stimulus Distortion (UR): Ability to overcome the effects of distortion or distraction when listening to and understanding speech and language. It is often difficult to separate UR from US in research studies.

Memory for Sound Patterns (UM): Ability to retain (on a short-term basis) auditory events such as tones, tonal patterns, and voices.

General Sound Discrimination (U3): Ability to discriminate tones, tone patterns, or musical materials with regard to their fundamental attributes (i.e., pitch, intensity, duration, and rhythm).

Temporal Tracking (UK): Ability to mentally track auditory temporal (sequential) events so as to be able to count, anticipate or rearrange them (e.g., reorder a set of musical tones). According to Stankov (2000), UK may represent the first recognition of the ability (Stankov & Horn, 1980) that is now interpreted as working memory (MW).

Musical Discrimination and Judgment (U1 U9): Ability to discriminate and judge tonal patterns in music with respect to melodic, harmonic, and expressive aspects (phrasing, tempo, harmonic complexity, intensity variations).

Maintaining and Judging Rhythm (U8): Ability to recognize and maintain a musical beat.

Sound-Intensity/Duration Discrimination (U6): Ability to discriminate sound intensities and to be sensitive to the temporal/rhythmic aspects of tonal patterns.

Sound-Frequency Discrimination (U5): Ability to discriminate frequency attributes (pitch and timbre) of tones.

Hearing and Speech Threshold factors (UA UT UU): Ability to hear pitch and varying sound frequencies.

Absolute Pitch (UP): Ability to perfectly identify the pitch of tones.

Sound Localization (UL): Ability to localize heard sounds in space.

Short-term memory (*Gsm*): The ability to apprehend and maintain awareness of a limited number of elements of information in the immediate situation (events that occurred in the last minute or so). A limited-capacity system that loses information quickly through the decay of memory traces, unless an individual activates other cognitive resources to maintain the information in immediate awareness.

Memory Span (MS): Ability to attend to, register, and immediately recall (after only one presentation) temporally ordered elements and then reproduce the series of elements in correct order.

Working Memory (MW): Ability to temporarily store and perform a set of cognitive operations on information that requires divided attention and the management of the limited capacity resources of short-term memory. Is largely recognized to be the mind's "scratchpad" and consists of up to four subcomponents. The *phonological or articulatory loop* processes auditory-linguistic information while the *visuo-spatial sketch/scratchpad* is the temporary buffer for visually processed information. The *central executive* mechanism coordinates and manages the activities and processes in working memory. The most recent component added to the model is the *episodic buffer*. Recent research (see McGrew, 2005) suggests that MW is *not* of the same nature as the other 60+ narrow factor-based trait-like individual difference constructs included in this table. MW is a theoretically developed construct (proposed to explain memory findings from experimental research) and not a label for an individual-differences type factor. MW is retained in the current CHC taxonomy table as a reminder of the importance of this construct in understanding new learning and performance of complex cognitive tasks (see McGrew, 2005).

Long-term storage and retrieval (*Glr*): The ability to store and consolidate new information in long-term memory and later fluently retrieve the stored information (e.g., concepts, ideas, items, names) through association. Memory consolidation and retrieval can be measured in terms of information stored for minutes, hours, weeks, or longer. Some *Glr* narrow abilities have been prominent in creativity research (e.g., production, ideational fluency, or associative fluency).

Associative Memory (MA): Ability to recall one part of a previously learned but unrelated pair of items (that may or may not be meaningfully linked) when the other part is presented (e.g., paired-associative learning).

Meaningful Memory (MM): Ability to note, retain, and recall information (set of items or ideas) where there is a meaningful relation between the bits of information, the information comprises a meaningful story or connected discourse, or the information relates to existing contents of memory.

Free Recall Memory (M6): Ability to recall (without associations) as many unrelated items as possible, in any order, after a large collection of items is presented (each item presented singly). Requires the ability to encode a "superspan collection of material" (Carroll, 1993, p. 277) that cannot be kept active in short-term or working memory.

Ideational Fluency (FI): Ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object. Quantity, not quality or response originality is emphasized. The ability to think of a large number of different responses when a prescribed task requires the generation of numerous responses. The ability to call up ideas.

Associational Fluency (FA): A highly specific ability to rapidly produce a series of words or phrases associated in meaning (semantically associated; or some other common semantic property) when given a word or concept with a restricted area of meaning. In contrast to Ideational Fluency (FI), quality rather quantity of production is emphasized.

Expressional Fluency (FE): Ability to rapidly think of and organize words or phrases into meaningful complex ideas under general or more specific cued conditions. Requires the production of connected discourse in contrast to the production of isolated words (e.g., FA FW). Differs from FI in the requirement

to rephrase given ideas rather than generating new ideas. The ability to produce different ways of saying much the same thing.

Naming Facility (NA): Ability to rapidly produce accepted names for concepts or things when presented with the thing itself or a picture of it (or cued in some other appropriate way). The naming responses must be in an individual's long-term memory store (i.e., objects or things to be named have names that are very familiar to the individual). In contemporary reading research this ability is called *rapid automatic naming* (RAN).

Word Fluency (FW): Ability to rapidly produce isolated words that have specific phonemic, structural, or orthographic characteristics (independent of word meanings). Has been mentioned as possibly being related to the "tip-of-the-tongue" phenomenon (e.g., word finding difficulties) (Carroll, 1993). One of the first fluency abilities identified (Eckstrom et al., 1979).

Figural Fluency (FF): Ability to rapidly draw or sketch as many things (or elaborations) as possible when presented with a non-meaningful visual stimulus (e.g., set of unique visual elements). Quantity is emphasized over quality or uniqueness.

Figural Flexibility (FX): Ability to rapidly change set and try-out a variety of approaches to solutions for figural problems that have several stated criteria. Fluency in successfully dealing with figural tasks that require a variety of problem solving approaches.

Sensitivity to Problems (SP): Ability to rapidly think of a number of alternative solutions to practical problems (e.g., what can people do to stay healthy?). More broadly may be considered the "ability to imagine problems associated with function or change of function of objects and to suggest ways to deal with these problems" Royce (1973). Requires the recognition of the existence of a problem.

Originality/Creativity (FO): Ability to rapidly produce unusual, original, clever, divergent, or uncommon responses (expressions, interpretations) to a given topic, situation, or task. The ability to invent unique solutions to problems or to develop innovative methods for situations where a standard operating procedure does not apply. Following a new and unique path to a problem solution. FO differs from FI in that FO focuses on the quality of creative responses while FI focuses on an individual's ability to think of a large number of different responses.

Learning Abilities (L1): General learning ability rate. Poorly defined by existing research.

Processing Speed (*Gs*): The ability to automatically and fluently perform relatively easy or over-learned elementary cognitive tasks, especially when high mental efficiency (i.e., attention and focused concentration) is required

Perceptual Speed (P): Ability to rapidly and accurately search, compare (for visual similarities or differences) and identify visual elements presented side-by- side or separated in a visual field. Recent research (Ackerman et al., 2002; Ackerman & Cianciolo, 2000; Ackerman & Kanfer, 1993; see McGrew, 2005) suggests P may be an *intermediate* stratum ability (between narrow and broad) defined by four narrow sub-abilities: (1) *Pattern Recognition (Ppr)*—the ability to quickly recognize simple visual patterns; (2) *Scanning (Ps)*—ability to scan, compare, and look up visual stimuli; (3) *Memory (Pm)*--ability to perform visual perceptual speed tasks that place significant demands on immediate short-term memory, and (d) *Complex (Pc)*—ability to perform visual pattern recognition tasks that impose additional cognitive demands such as spatial visualization, estimating and interpolating, and heightened memory span loads.

Rate-of-Test-Taking (R9): Ability to rapidly perform tests which are relatively easy or over-learned (require very simple decisions). This ability is not associated with any particular type of test content or stimuli. May be similar to a higher-order "psychometric time" factor (Roberts & Stankov, 1998; Stankov,

2000). Recent research has suggested that R9 may better be classified as an *intermediate* (between narrow and broad strata) ability that subsumes most all psychometric speeded measures (see McGrew, 2005).

Number Facility (N): Ability to rapidly perform basic arithmetic (i.e., add, subtract, multiply, divide) and accurately manipulate numbers quickly. N does not involve understanding or organizing mathematical problems and is not a major component of mathematical/quantitative reasoning or higher mathematical skills.

Speed of Reasoning (RE): Speed or fluency in performing reasoning tasks (e.g., quickness in generating as many possible rules, solutions, etc., to a problem) in a limited time. Also listed under *Gf*.

Reading Speed (fluency) (RS): Ability to silently read and comprehend connected text (e.g., a series of short sentences; a passage) rapidly and automatically (with little conscious attention to the mechanics of reading). Also listed under *Grw*.

Writing Speed (fluency) (WS): Ability to correctly copy words or sentences repeatedly, or writing words, sentences, or paragraphs, as quickly as possible. Also listed under *Grw* and *Gps*.

Reaction and decision speed (*Gt*): The ability to make elementary decisions and/or responses (simple reaction time) or one of several elementary decisions and/or responses (complex reaction time) at the onset of simple stimuli. *Gt* is typically measured by chronometric measures of reaction and inspection time.

Simple Reaction Time (R1): Reaction time (in milliseconds) to the onset of a single stimulus (visual or auditory) that is presented at a particular point of time. R1 frequently is divided into the phases of decision time (DT; the time to decide to make a response and the finger leaves a home button) and movement time (MT; the time to move finger from the home button to another button where the response is physically made and recorded).

Choice Reaction Time (R2): Reaction time (in milliseconds) to the onset of one of two or more alternative stimuli, depending on which alternative is signaled. Similar to R1, can be decomposed into DT and MT. A frequently used experimental method for measuring R2 is the Hick paradigm.

Semantic Processing Speed (R4): Reaction time (in milliseconds) when a decision requires some encoding and mental manipulation of the stimulus content.

Mental Comparison Speed (R7): Reaction time (in milliseconds) where stimuli must be compared for a particular characteristic or attribute.

Inspection Time (IT): The ability to quickly (in milliseconds) detect change or discriminate between alternatives in a very briefly displayed stimulus (e.g., two different sized vertical lines joined horizontally across the top).

Psychomotor speed (*Gps*): The ability to rapidly and fluently perform physical body motor movements (e.g., movement of fingers, hands, legs, etc.) largely independent of cognitive control.

Speed of Limb Movement (R3): The ability to make rapid specific or discrete motor movements of the arms or legs (measured after the movement is initiated). Accuracy is not important.

Writing Speed (fluency) (WS): The ability to copy correctly words or sentences repeatedly, or writing words, sentences, or paragraphs, as quickly as possible. Also listed under *Grw* and *Gps*.

Speed of Articulation (PT): Ability to rapidly perform successive articulations with the speech musculature.

Movement Time (MT): Recent research (see summaries by Deary, 2003; Nettelbeck, 2003; also see McGrew, 2005) suggests MT may be an intermediate stratum ability (between narrow and broad strata) that represents the second phase of reaction time as measured by various elementary cognitive tasks (ECTs). The time taken to physically move a body part (e.g., a finger) to make the required response is movement time (MT). MT may also measure the speed of finger, limb, or multi-limb movements or vocal articulation (diadochokinesis; Greek for "successive movements") (Carroll, 1993; Stankov, 2000) and is also listed under *Gr*.

Quantitative knowledge (*Gq*): The breadth and depth of a person's acquired store of declarative and procedural quantitative or numerical knowledge. *Gq* is largely acquired through the investment of other abilities primarily during formal educational experiences. *Gq* represents an individual's store of acquired mathematical knowledge, not reasoning with this knowledge. Factor analysis research has been limited in this domain and other *Gq* narrow abilities most likely exist (e.g., dimensions of early number sense or literacy).

Mathematical Knowledge (KM): Range of general knowledge about mathematics. Not the performance of mathematical operations or the solving of math problems.

Mathematical Achievement (A3): Measured (tested) mathematics achievement.

Reading and writing (*Grw*): The breadth and depth of a person's acquired store of declarative and procedural reading and writing skills and knowledge. *Grw* includes both basic skills (e.g., reading and spelling of single words) and the ability to read and write complex connected discourse (e.g., reading comprehension and the ability to write a story).

Reading Decoding (RD): Ability to recognize and decode words or pseudowords in reading using a number of sub-abilities (e.g., grapheme encoding, perceiving multi-letter units, and phonemic contrasts, etc.)

Reading Comprehension (RC): Ability to attain meaning (comprehend and understand) connected discourse during reading.

Verbal (printed) Language Comprehension (V): General development, or the understanding of words, sentences, and paragraphs in native language, as measured by reading vocabulary and reading comprehension tests. Does not involve writing, listening to, or understanding spoken information.

Cloze Ability (CZ): Ability to read and supply missing words (that have been systematically deleted) from prose passages. Correct answers can only be supplied if the person understands (comprehends) the meaning of the passage.

Spelling Ability (SG): Ability to form words with the correct letters in accepted order (spelling).

Writing Ability (WA): Ability to communicate information and ideas in written form so that others can understand (with clarity of thought, organization, and good sentence structure). Is a broad ability that involves a number of other writing sub-skills (e.g., knowledge of grammar, the meaning of words, and how to organize sentences or paragraphs).

English Usage Knowledge (EU): Knowledge of the "mechanics" (capitalization, punctuation, usage, and spelling) of written and spoken English language discourse.

Reading Speed (fluency) (RS): Ability to silently read and comprehend connected text (e.g., a series of short sentences; a passage) rapidly and automatically (with little conscious attention to the mechanics of reading). Also listed under *Gs*.

Writing Speed (fluency) (WS): Ability to copy words or sentences repeatedly, or writing words, sentences, or paragraphs, as quickly as possible. Also listed under *Gs* and *Gps*.

Psychomotor abilities (*Gp*): The ability to perform physical body motor movements (e.g., movement of fingers, hands, legs, etc) with precision, coordination, or strength. Movement or motor behaviors are typically the result of mental activity.

Static Strength (P3): The ability to exert muscular force to move (push, lift, pull) a relatively heavy or immobile object.

Multilimb Coordination (P6): The ability to make quick specific or discrete motor movements of the arms or legs (measured after the movement is initiated). Accuracy is not relevant.

Finger Dexterity (P2): The ability to make precisely coordinated movements of the fingers (with or without the manipulation of objects).

Manual Dexterity (P1): Ability to make precisely coordinated movements of a hand, or a hand and the attached arm.

Arm-hand Steadiness (P7): The ability to precisely and skillfully coordinate arm-hand positioning in space.

Control Precision (P8): The ability to exert precise control over muscle movements, typically in response to environmental feedback (e.g., changes in speed or position of object being manipulated).

Aiming (AI): The ability to precisely and fluently execute a sequence of eye-hand coordination movements for positioning purposes.

Gross Body Equilibrium (P4): The ability to maintain the body in an upright position in space or regain balance after balance has been disturbed.

Olfactory abilities (*Go*): Abilities that depend on sensory receptors of the main olfactory system (nasal chambers). The cognitive and perceptual aspects of this domain have not yet been widely investigated.

Olfactory Memory (OM): Memory for odors (smells).

Olfactory Sensitivity (OS): Sensitivity to different odors (smells).

Tactile abilities (*Gh*): Abilities involved in the perception and judging of sensations that are received through tactile (touch) sensory receptors. Includes abilities involved in the judgment of thermal stimulation, spatial stimulation, or patterns imposed on the skin. The cognitive and perceptual aspects of this domain have not yet been widely investigated.

Tactile Sensitivity (TS): The ability to detect and make fine discriminations of pressure on the surface of the skin.

Kinesthetic abilities (*Gk*): Abilities that depend on sensory receptors that detect bodily position, weight, or movement of the muscles, tendons, and joints. Abilities involved in the process of controlling and coordinating body movements, including walking, talking, facial expressions, gestures and posture. The cognitive and perceptual aspects of this domain have not yet been widely investigated.

> Kinesthetic Sensitivity (KS): The ability to detect, or be aware, of movements of the body or body parts, including the movement of upper body limbs (arms) and the ability to recognize a path the body previously explored without the aid visual input (blindfolded)

Note. Many of the ability definitions in this table, or portions thereof, were originally published in McGrew (1997), which in turn, were developed from a detailed reading of *Human cognitive abilities: A survey of factor analytic studies,* by J. B. Carroll. 1993, New York: Cambridge University Press, Copyright 1993 by Cambridge University Press. The two-letter narrow (stratum I) ability factor codes (e.g., RG), as well as most of the broad ability factor codes (e.g., *Gf*) are from Carroll (1993). McGrew's (1997) definitions have been revised and extended here based on a review of a number of additional sources. Primary sources included Carroll (1993), Corsini (1999), Ekstrom et al. (1979), Fleishman & Quaintance (1984), and Sternberg (1994). The broad ability definitions included in this table are from McGrew (2009).

Appendix 3: Informed Consent Form

Department of Education
Notice of Informed Consent

As a current Psychologist or Candidate Registered in Nova Scotia, you are invited to participate in the following research study. If you conduct psycho-educational assessments and/or identify learning disabilities in children and adolescents as part of your practice, you are eligible to complete the survey. This study is being conducted as a requirement of the Masters of Arts in School Psychology, a program offered through the Department of Education at Mount Saint Vincent University, and the survey has been approved by the University Research Ethics Board. The principal researcher for this study is Pamela Blotnicky, and her supervisor is Dr. Fred French.

If you choose to participate in this study, you will be asked to complete an 8-10 minute questionnaire about learning disability assessment practices. Questions will focus on your current learning disability assessment methods as well as on your preferences and attitudes regarding the future of learning disability assessment and diagnosis in Nova Scotia.

If you have any questions or concerns regarding this study, please contact the student researcher, Pamela Blotnicky (telephone 830-9859, fax 832-9389, email pamela.blotnicky@msvu.ca) or Dr. Fred French (telephone 457-6186, email frederick.french@msvu.ca). If you have ethical concerns and wish to speak to someone not involved with the current study, please contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research and International Office, at 457-6350 or via e-mail at research@msvu.ca

Mount Saint Vincent University, Pamela Blotnicky, and her thesis committee respect the rights of research participants to understand and agree to the rules by which research is undertaken. Please note the following:

- You may skip any questions you do not wish to answer.
- You may end the survey at any time.
- You will remain anonymous. The information you provide will be used for descriptive purposes only. Only group results will be reported, and individual participants will not be identified within the research process. The electronic consent does not identify individual participants.

The survey is being completed online and data will be stored on a secure website based in the United Kingdom. This server is subject to the laws regarding privacy and data protection in the United Kingdom. Upon completion of data collection, the information will be downloaded and stored on a password-protected computer at Mount Saint Vincent University.

If you understand and agree to these rules and wish to complete the survey, please select "Yes" from the drawdown menu to proceed with the online survey. **Please note that by continuing to participate in the survey, you are giving your free and informed consent.** If you do not wish to participate, please select "No" from the drawdown menu, and the survey will be discontinued.

Halifax Nova Scotia B3M 2J6 Canada
Tel 902 457 6178 • Fax 902 457 4911
www.msvu.ca

Appendix 4: Questionnaire

1) I give my free and informed consent and wish to participate in this study now.	
Yes	
No	

2) The following items address which tests or procedures you currently use in your child psycho-educational assessment practice. Please check the column that best describes your *current use* of each given test or procedure.

*Specified items adapted from Woods and Farrell's (2006) survey of educational psychologists in England and Wales.

	Use rarely or never (do not have suffcient resources, training, or support to use the test/procedure)	Use rarely or never (do not like to use the test/procedure)	Use occasionally	Use always or almost always	Unfamiliar with this test or procedure	Not Applicable
Interview a parent or guardian*						
Interview client*						
Interview school staff*						
Observe child in classroom						
Observe child on the playground*						
Observe child in physical education class						
Review child's cumulative education file						

Full cognitive assessment battery* (e.g., Wechsler Intelligence Scales, Woodcock-Johnson Tests of Cognitive Ability, Stanford Binet Intelligence Scales)						
Partial cognitive assessment battery* (e.g., selected subtests from a full cognitive battery)						
Specific test of phonological processing (e.g., Comprehensive Test of Phonological Processing)						
Specific test of memory/attention (e.g., Children's Memory Scale)						
Specific test of Processing Speed (e.g., WISC-IV Processing Speed Index)						
Specific test of Visual-Motor Processing (e.g., Beery-Buktenica Developmental Test of visual-Motor Integration)						
Full achievement battery (e.g., Wechsler Individual Achievement Test, Woodcock Johnson Tests of Achievement)						
Partial achievement battery (e.g., selected subtests from a full achievement battery)						
Formal evaluation of child's prior response to intervention						
IQ-Achievement Discrepancy Analysis based on Full Scale IQ						

or General Ability Index and achievement scores						
Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carroll (CHC) theory (either through cross-battery assessment or through use of the Woodcock Johnson III)						
Achenbach and/or Conners Teacher Report Form						
Achenbach and/or Conners Parent Report Form						
Achenbach and/or Conners Self-Report Form						
Evaluation of personality, behavioural, and emotional functioning (e.g., with a behaviour checklist filled out by parents, youth, or school staff, and/or through interviews—excluding Achenbach and Conners checklists)						

Comments

If you answered that you regularly administer a full or partial cognitive assessment battery, which battery do you use most often?	
Wechsler Intelligence Scales (WPPSI-III , WISC-IV, and/or WAIS-IV)	
Woodcock Johnson Tests of Cognitive Abilities, Third Edition (WJ III)	
Stanford-Binet Intelligence Scales, Fifth Edition (SB5)	

Other (Please Specify):

3) The following items address your preferences for each test or procedure. Please indicate which column best represents your *preferences* for each given test or procedure.

*Specified items adapted from Woods and Farrell (2006) survey of educational psychologists in England and Wales.

	Use and prefer	Use but do not prefer	Do not use but would prefer to use, given sufficient resources, training, and support	Do not use and would not prefer to use	Unfamiliar with this test or procedure	Not Applicable
Interview a parent or guardian*						
Interview client*						
Interview school staff*						
Observe child in classroom						
Observe child on the playground*						
Observe child in physical education class						
Review child's cumulative education file						
Full cognitive assessment battery* (e.g., Wechsler Intelligence Scales, Woodcock-Johnson Tests of Cognitive Ability, Stanford Binet Intelligence Scales)						

Partial cognitive assessment battery* (e.g., selected subtests from a full cognitive battery)						
Specific test of phonological processing (e.g., Comprehensive Test of Phonological Processing)						
Specific test of memory/attention (e.g., Children's Memory Scale)						
Specific test of Processing Speed (e.g., WISC-IV Processing Speed Index)						
Specific test of Visual-Motor Processing (e.g., Beery-Buktenica Developmental Test of visual-Motor Integration)						
Full achievement battery (e.g., Wechsler Individual Achievement Test, Woodcock Johnson Tests of Achievement)						
Partial achievement battery (e.g., selected subtests from a full achievement battery)						
Formal evaluation of child's prior response to intervention						
IQ-Achievement Discrepancy Analysis based on Full Scale IQ or General Ability Index and achievement scores						

Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carroll (CHC) theory (either through cross-battery assessment or through use of the Woodcock Johnson III)						
Achenbach and/or Conners Teacher Report Form						
Achenbach and/or Conners Parent Report Form						
Achenbach and/or Conners Self-Report Form						
Evaluation of personality, behavioural, and emotional functioning (e.g., with a behaviour checklist filled out by parents, youth, or school staff, and/or through interviews—excluding Achenbach and Conners checklists)						

Comments

4) Please indicate which tests or procedures you *do not currently use* but would **definitely** use given sufficient resources, training, and support. (Check all that apply.)

*Specified items adapted from Woods and Farrell (2006) survey of educational psychologists in England and Wales.

Interview a parent or guardian*	
Interview client*	
Interview school staff*	

Observe child in classroom	
Observe child on the playground*	
Observe child in physical education class	
Review child's cumulative education file	
Full cognitive assessment battery* (e.g., Wechsler Intelligence Scales, Woodcock-Johnson Tests of Cognitive Ability, Stanford Binet Intelligence Scales)	
Partial cognitive assessment battery* (e.g., selected subtests from a full cognitive battery)	
Specific test of phonological processing (e.g., Comprehensive Test of Phonological Processing)	
Specific test of memory/attention (e.g., Children's Memory Scale)	
Specific test of Processing Speed (e.g., WISC-IV Processing Speed Index)	
Specific test of Visual-Motor Processing (e.g., Beery-Buktenica Developmental Test of visual-Motor Integration)	
Full achievement battery (e.g., Wechsler Individual Achievement Test, Woodcock Johnson Tests of Achievement)	
Partial achievement battery (e.g., selected subtests from a full achievement battery)	
Formal evaluation of child's prior response to intervention	
IQ-Achievement Discrepancy Analysis based on Full Scale IQ or General Ability Index and achievement scores	
Evaluation of specific cognitive processes and achievement using methods derived from Cattell-Horn-Carroll (CHC) theory (either through cross-battery assessment or through use of the Woodcock Johnson III)	
Achenbach and/or Conners Teacher Report Form	

Achenbach and/or Conners Parent Report Form	
Achenbach and/or Conners Self-Report Form	
Evaluation of personality, behavioural, and emotional functioning (e.g., with a behaviour checklist filled out by parents, youth, or school staff, and/or through interviews—excluding Achenbach and Conners checklists)	
Other (Please Specify):	

Comments

5) Overall, how satisfied are you with your current approach to psycho-educational assessment?	
0 Very Dissatisfied	
1 Somewhat Dissatisfied	
2 Neither Satisfied nor Dissatisfied	
3 Somewhat Satisfied	
4 Very Satisfied	

Comments

6) The following questions ask about your feelings about using new psycho-educational assessment methods and interventions. A "specified, step-by-step approach/procedure" refers to any technique or intervention that has specific guidelines and/or components that are outlined for you and/or that are to be followed in a structured or predetermined way (e.g., a cross-battery approach in which each step of the assessment is predetermined). Please indicate the extent to which you agree with each item using the following scale:

*Items 1-15 adapted from Aarons' (2005) Evidence-Based Practice Attitude Scale (EBPAS).

	0 Not at All	1 To a Slight Extent	2 To a Moderate Extent	3 To a Great Extent	4 To a Very Great Extent
1. I like to use new learning disability assessment techniques/interventions to help my clients.					
2. I am willing to try new assessment techniques/interventions even if I have to follow a specified, step-by-step procedure.					
3. I know better than academic researchers how to care for my clients.					
4. I am willing to use new and different assessment techniques/interventions developed by researchers.					
5. Research-based assessments/interventions are not clinically useful.					
6. Clinical experience is more important than using research-based assessment techniques/interventions.					
7. I would not use procedures requiring a specified, step-by-step approach					
8. I would try a new assessment technique/intervention even if it were very different from what I am used to doing.					
9. For questions 9-16: If you received training in an assessment technique/intervention that					

was new to you, how likely would you be to adopt it if: ..... it was intuitively appealing?					
10. ... it “made sense” to you?					
11. ... it was required by your supervisor?					
12. ... it was required by your agency or school board?					
13. ... it was required by your province?					
14. ... it was being used by colleagues who were happy with it?					
15. ... you felt you had enough training to use it correctly?					
16. ... you felt you had enough time?					

Comments

7) Please indicate to what extent you agree with the following statements.

	0 Not at All	1 To a Slight Extent	2 To a Moderate Extent	3 To a Great Extent	4 To a Very Great Extent
An IQ test is crucial for determining the presence of a learning disability.					
A Full Scale IQ score or General Ability Index must be calculated to determine the presence of a learning disability.					
Presence of an IQ-achievement discrepancy is necessary for the diagnosis of a learning disability.					

Presence of an IQ-achievement discrepancy is sufficient for the diagnosis of a learning disability.					
A three-tiered Response to Intervention (RTI) model can be practically implemented in public school systems.					
An evaluation of a student's prior response to intervention is necessary for learning disability diagnosis.					
An evaluation of a student's prior response to intervention is sufficient for learning disability diagnosis.					
Achievement scores and underachievement alone are sufficient for the diagnosis of a learning disability.					

Comments

8) How often do you engage in the following activities for purposes of professional development?

	0 Never	1 Occasionally	2 Regularly	Not Applicable
Attend school board-based professional development sessions				
Attend academic conferences				
Read peer-reviewed journal articles				
Take formal classes in the area				
Read books by predominant researchers in the area				

Consult with other psychologists or assessment professionals regarding assessment practices				
Read literature published by the CPA, APA, or other professional psychology organizations				
Other (please specify in comments box)				

Comments

9) DEMOGRAPHIC QUESTIONNAIRE Please indicate your sex.	
Male	
Female	
Prefer not to answer	

Please indicate which category contains your age.	
Under 25	
25 to 34	
35 to 44	
45 to 54	
55 to 64	
65 and over	

Please indicate the geographic regions in which you work (check all that apply):	
Digby, Yarmouth, and/or Shelburne County	
Annapolis, Kings, and/or Hants County	
Region of Queens Municipality and/or Lunenburg County	
Halifax Regional Municipality	
Cumberland, Colchester, and/or Pictou County	
Guysborough, Antigonish, Inverness, and/or Richmond County	
Cape Breton Regional Municipality and/or Victoria County	
Other (Please Specify):	

Please indicate your workplace (check all that apply):	
Annapolis Valley Regional School Board	
Cape Breton-Victoria Regional School Board	
Chignecto-Central Regional School Board	
Halifax Regional School Board	
South Shore Regional School Board	
Strait Regional School Board	
Tri-County Regional School Board	
Conseil Scolaire Acadien Provincial	
Private/Other School Board	

Hospital	
Private Practice	
Other (Please Specify):	

Do you work full time or part time as a psychologist/candidate register?	
Full time	
Part time	

What is the highest level of education you have completed?	
Masters Degree	
Doctoral Degree	
Other	

Please specify degree and area (e.g., "MA in School Psychology," "Ph.D. in Clinical Psychology," "Psy.D.")

For how many years have you been a practicing psychologist/candidate register?	
0 to 5	
6 to 10	
11 to 15	
16 to 20	

21 to 25	
26 to 30	
Over 30	

For how many years have you performed psycho-educational assessments?	
0 to 5	
6 to 10	
11 to 15	
16 to 20	
21 to 25	
26 to 30	
Over 30	

That is all the questions I have for you. Thank you very much for your time.

Appendix 5: Anecdotal Questionnaire Responses

[sic – minus identifying information]

2) The following items address which tests or procedures you currently use in your child psycho-educational assessment practice. Please check the column that best describes your *current use* of each given test or procedure.

- BASC

- I infrequently interview the parent in person . but instead, provide a comprehensive questionnaire in regards to the student's current functioning and his/her biopsychosocial history.

- Some of those tests (CTOPP, Conners questionnaires, etc.) are used only when the situation suggests that they may be useful (e.g., if a child struggles with reading then CTOPP; if there are symptoms suggestive of ADHD or if a student has been previously diagnosed with ADHD).

- While a use a full test battery (e.g. WISC) i will also pull some subtests from other batteries such as recall of designs from the DAS. Same for achievement.

- I answered that I almost always use a phonological test, but this is only if it is a reading referral and if the cognitive profile suggests LD, rather than overall low ability.

- I work in a unique situation. I do not have access to parents but when I do I always talk to them. I include observations from social workers when available. I would very much like to use cross battery methods but I do not have a diverse battery of assessments to choose from. I use the discrepancy method but many of my kids meet LD criteria but their difficulties in learning are more likely due to lack of quality learning opportunities.

- BASC-2, BRIEF

- The above depends on the referral question and age of the child

- Woodcock tests have phonological awareness imbedded, so do not always need CTOPP

- Use of Connors and Achenbach depends on the nature of the referral issue, interviews with parents/teachers, student observations and history. In regards to which cog test I use - I am still developing competencies with WJ-III - still use WISC-IV most, but plan to change in near future to more cross battery

- I often informally substitute the original WIAT Reading Comprehension and Listening Comprehension subtests (with appropriate cautions in the test report) because the WIAT II versions are so unsatisfactory. I hope to substitute the WJ III Ach I recently purchased, but it's incredibly complex to get up running. I have always found behavioural checklists to be almost useless, frequently misused (e.g., as a definitive diagnosis for ADHD), and providing as much information about the rater as the child.

- We have limited resources within our school board....if we had more assessment tools I would make use of them.

- My psychoed assessments are tailored to the individual (depending on learning

strengths/weakness) - therefore, some of the "always" I indicated are actually like "sometimes"

- We have very limited testing resources within the ... School Board. I use some of the tools because they are the only ones available.

- Piers-Harris

- Wish that we had access to using the WJ-III (cognitive and academic) in the .... (School Board)!

- I rarely to this as I receive very few referrals relating to this kind of issue. However, when I do receive these types of referrals I always have checklists completed (e.g., CDI)

If you answered that you regularly administer a full or partial cognitive assessment battery, which battery do you use most often?

- I use both Differential ability scales and WISC pretty regularly

- Also use SB:V frequently for clients with ID

3) The following items address your <u>preferences</u> for each test or procedure. Please indicate which column best represents your *preferences* for each given test or procedure.

- I don't like the Conners, I use the BRIEF. Old Conners (I haven't used the new) inattentive scale was too heavily loaded on learning items (e.g. trouble reading)

- Something that you don't seem to have allowed for in this survey is the fact that a psychologist who does assessments but does not work within the school system might find it extremely difficult to review the cum file, do an observation, and assess RTI. An option that says something like "would like to but there are systemic barriers" or "do not use but would like to use" would have been nice.

- BASC-2, BRIEF

- Again, the answers depend on referral question and age of the child

- I don't like the Achenbach scales. I use them only because it's all we have access to. I would prefer to use the BASC.

- We do not have access to programs like the BASC checklists. The Achenbach checklists are outdated and only have one normative sample, I don't find it age specific enough. The Conners is great for Attention, but I find we lack the tools needed to do a proper differential diagnosis.

- Would really like to have access to tools such as the BASC-2.

4) Please indicate which tests or procedures you *do not currently use* but would <u>definitely</u> use given sufficient resources, training, and support. (Check all that apply.)

"Other Responses"

- Neuropsychological Assessment Tools as they relate to cognitive functioning

- NEPSY (with training)

- more tools for CHC theory implementation

- Woodcock Johnson

- Would prefer to use the WJ-III cognitive and assessment batteries, as well as the BASC-2.

Comments

- I would like to have more time to test things like Executive functioning

- I use all the ones I prefer to use

- Use the WJ Diagnostic scales to cover memory, so do not use CMS

- I feel I would benefit from more training in this area. It wasn't covered in our graduate course work.

- As a private practitioner - we rely on report cards as we do not have direct access to the sum file

- We have the CMS...I don't use it because it's very outdated. I would make use of a newer, more current scale if we had access to one.

I can only use RTI if my schools are using it. If they are not providing evidence based instruction, I can not evaluate a child on how they respond to it.

- Wish that we had the freedom to select our own tests, (of course, as long as they have sufficient validity and reliability).

5) Overall, how satisfied are you with your current approach to psycho-educational assessment?

- always room to improve, mostly interested in developing report writing skills. Wanting to improve meaningful integration of the test data without just reporting performance on scales and subtests.

- Unfortunately the time it takes to get a comprehensive understanding of a child it not cost effective. I don't think the community uses psy ass to it full potential either.

- I feel that I've done a lot of recent reading etc on both LD and assessment that have enhanced my assessment practices BUT recognize that access to other assessment tools would enhance my practice.

- Lots still to learn about WJ3

- I am satisfied with my assessment practices and materials - time for observations and interviews is difficult to carve out in the school setting. I use on-line Connors and Achenbach so this is a real time saver and allows for more consistent use.

- I am often frustrated by the limited amount of assessment tools we have at our disposal. I am particularly concerned with how we have access to only one main cognitive test for all children. As the research shows that certain tests are able to provide more reliable information for specific ages, and difficulties, I feel we should be able to select assessment measures that reflect the referral question, and not simply have to rely on "it's all we have access to".

- A crossbattery approach would be a lot better but it takes to much time and will cost to much money

- I feel I lack the tools to do my job properly. We did not receive enough training on differential diagnosis within our program. Several of us are seeking outside training in this area, but as we lack assessment measures to properly assess a child's social, emotional and behavioral functioning, we can only do so much. I also am very much against a school board as large as ours having only one cognitive test for all children. We should be choosing cognitive tests based on the nature of the referral, and not based on "this is all I have access to".

- We are changing our practice as of next year to include parent interviews for every case. We are also going to start calling and explaining the testing process before we see the student (instead of just receiving a signed consent form). This will be challenging to "sell" to schools, as it will make the psych-ed process even longer. Schools don't seem to understand the importance of these interviews and just want kids "tested".

6) The following questions ask about your feelings about using new psycho-educational assessment methods and interventions. A "specified, step-by-step approach/procedure" refers to any technique or intervention that has specific guidelines and/or components that are outlined for you and/or that are to be followed in a structured or predetermined way (e.g., a cross-battery approach in which each step of the assessment is predetermined). Please indicate the extent to which you agree with each item using the following scale:

- Mostly all the above questions about adopting a new test is that also it is research and evidence based, these are the things I use to help me decide if it "makes sense".

- It is really all about time and money. Becoming proficient at a new assessment takes so much time. Question #6 was difficult to answer on a likert sacle. Methods must be driven by research but clinical knowledge is necessary to make an ass make sense and useful.

- Some of these questions are double negatives...hard to know how to answer

- This is difficult to respond to...I am very open and interested in learning and using whatever assessment and intervention methods will serve students best. However, in the school setting, scheduling, case load and other demands (ie. behaviour assessment, in-servicing) makes it

difficult to find the time to try new assessments and procedures that will make it hard to keep up with referrals as I learn. The willingness is there - the system to support this isn't always there. In regards to trying new approaches dictated by the school board, province etc. - I would do it if it was appropriate to ethical and efficient practice - I challenge it if it affected these two things or impeded efficient service to students and schools.

7) Please indicate to what extent you agree with the following statements.

- The majority of my kids meet criteria for a learning disability but their difficulties are more accurately attributed to social/emotional difficulties or lack of quality learning opportunities. It is not helpful to diagnosis my kids with LDs.

- I don't know what the response to intervention model is

- hard questions...e.g., I don't think an IQ test is used to determine the presence of LD, but rather is used to rule out other causes of learning difficulties such as low cognitive ability. The wording of your questions did not allow for these types of responses

- Not familiar with RTI - therefore, had a hard time choosing answers for those items (need a n/a category)

8) How often do you engage in the following activities for purposes of professional development?

- Attend conferences related specifically to school psychology, behaviour, learning disability assessment/diagnosis/intervention, etc.

- Attend psychology discussion group on a monthly basis and attend a peer supervision group at my workplace

- I wish I read more!!

- You seem to assume that respondents work in school boards/agencies.

- Publish

- I am not a school board employee and therefore do not attend PD at schools

- read new research articles on assessment and take part in classes or workshops

- Attend training opportunities

Please indicate your workplace (check all that apply): "other responses"

- Not for profit organization

- Community Services

- University Faculty

Please specify degree and area (e.g., "MA in School Psychology," "Ph.D. in Clinical Psychology," "Psy.D.")

- MA in School Psychology
- M.A. in School Psychology
- PhD - Clinical Psychology
- MASP
- MA in School Psychology
- MSc in Applied Psychology
- MA in School Psychology
- MA School Psychology
- PhD in Clinical Psychology
- MASP
- ma school psych
- I have an MA in School Psychology and a PhD in Clinical Psychology
- PhD in Clinical Psychology
- MA in School Psychology
- Ph.D. Ed. Psych.
- PhD Clinical Psychology
- MA in School Psychology
- PhD in Counselling Psychology
- M.Sc in School psychology
- M.ED
- PhD Clinical
- EdD School and Clinical
- PhD Psychology
- MA in School Psychology
- PhD Clincial

- MSc Applied Psychology

- MASP

- Drs. in Developmental Psychology in Europe

- MA in Clinical Child Psychology
PhD (in same) to be conferred fall 2010

- MA in School Psychology

- MASP

- MA in School Psychology

- MA in School psychology

- MA School Psychology