

Using CHC-based Strengths and Difficulties to
Communicate Assessment Results to Teachers

Natasha H. Buchanan

Mount Saint Vincent University

Author Note

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Abstract

The effectiveness of supplementing a psychoeducational report with a CHC-based listing of a student's cognitive strengths and areas of difficulty was examined. Elementary-level school teachers read a psychoeducational report, either with or without the supplemental listing, and developed intervention ideas for various school assignments, based on the assessment results. Results indicated no significant differences between groups regarding number of interventions developed. Teachers were, however, significantly more satisfied with the way information was presented in the report when it was supplemented with the CHC-based listing.

Keywords: psychoeducational reports, report writing, teachers, CHC theory, cognitive abilities, interventions, intervention development, psychoeducational assessment

Using CHC-based Strengths and Difficulties to Communicate Assessment Results to Teachers

The psychoeducational report is a large part of the bridge between school psychologists and teachers. These reports indicate to teachers how specific students learn best, play crucial roles in the development and implementation of classroom interventions, and can influence the academic achievement of students in the classroom (Byrnes, 2008; Pelco, Ward, Coleman, & Young, 2009). According to Mastoras, Climie, McCrimmon, and Schwean (2011), teachers are the primary readers of psychoeducational reports. Teachers are not only expected to carry out the recommendations of the report, but also to continue to develop further interventions of their own, using the information provided (Pelco et al., 2009). In addition, when looking at the services, roles, and functions of school psychologists in Canada, Jordon, Hindes, and Saklofske (2009) discovered that school psychologists spend most of their time conducting cognitive assessments, with report writing being the second most time consuming practice (in Nova Scotia, it is estimated that school psychologists dedicate approximately 50% of their time to services related to psychoeducational assessment; Corkum, French, & Dorey, 2007). For these reasons, it seems logical for school psychologists to write in a way that allows teachers to understand the information presented and develop ideas for interventions that flow easily and logically from the assessment results.

The Psychological Report

The Function and Components of the Report

Over the past few decades, the overall function of psychoeducational reports has shifted to include an increased focus on classroom instruction and intervention, in addition to diagnosis

and classification (Lekwa & Ysseldyke, 2010). Aside from presenting the test results of the individual being evaluated, the psychological report provides information about the client's personality, behaviour, school and/or family history, individual strengths and areas of difficulty, and educational recommendations (Braaten, 2007; Bell, 2002). One of the most important roles of the school psychologist is to provide information in the report that clearly leads to the development of interventions and accommodations for the student (Reschly & Ysseldyke, 2002). Hence, the psychoeducational report can have a large influence on the decisions made about the student, which can have a large effect on the student's future (e.g. university or employment choices; Michaels, 2006). Essentially, these reports are intended to help others understand the needs of the client, and assist with putting appropriate interventions in place, which, combined, can help the client develop and reinforce coping strategies and, ultimately, improve overall performance and self-fulfilment in various areas of life (Harvey, 2006; Pelco et al., 2009).

Lichtenberger, Mather, Kaufman, and Kaufman (2004) identified the following as the main components of a standard psychological report: referral reason, tests administered, background information, behavioural observations, interpretation of results, summary, and recommendations. They explained that the referral reason generally provides the rationale for the evaluation (e.g. academic difficulties, potential giftedness, etc.) and, therefore, determines the focus of the assessment. The background information generally includes any relevant information about the client's personal history (e.g. educational history, previous assessment results, etc.). Behavioural observations often consist of behaviours observed through the assessment process (e.g. level of motivation, attentiveness, etc.), but can also include other forms of observations, such as a student's behaviour in the classroom. The results and interpretation section includes data from the assessments administered, along with probable explanations for

the test results. The summary includes a brief (often one page) review of the findings and interpretations and, when applicable, a description of the data that support a diagnosis. Some readers refer to the summary for a quick review of the findings; thus, this section can sometimes be one of the most influential sections of the entire report (Lichtenberger et al., 2004). The recommendations section, however, is often considered the most important section of the report (Brenner, 2003; Harvey, 2006; Overton, 2000). This section generally includes suggested interventions based on the referral question and assessment results and, in the school setting, recommendations often focus on helping students reach their academic potential (Lichtenberger, Mather, Kaufman, and Kaufman, 2004). Psychoeducational reports, however, have been found to differ greatly with regard to the usefulness of information provided in this section (i.e. many suggestions are considered unclear, inappropriate, or overly general; Harvey, 2006; Jordon, Hindes, & Saklofske, 2009; Overton, 2000; Pelco et al., 2009). Hence, in these cases, teachers can be faced with the challenge of developing interventions on their own, using the information provided in the report. It is important to note that, some teachers may be faced with this same challenge even when the recommendations provided are clear and realistic for the classroom, namely in situations where a suggested intervention is not working anymore, or an intervention was not suggested for a specific or unforeseen situation. Since school psychologists are generally assigned to a number of schools, they are not typically available on a daily basis for consultation purposes with teachers. For example, in Nova Scotia, the minimum recommended ratio of school psychologists to students is 1:2500 (Nova Scotia Department of Education, 2001), and it is not unusual for one school psychologists to be assigned to a number of schools, serving 3,000-4,000 students (Hann, 2001).

Report Styles

According to Lichtenberger et al. (2004), there are three basic formats of the psychological report: test-by-test, domain-by-domain, and ability-by-ability. Some clinicians prefer to integrate various elements of the three styles when writing reports. The style of report chosen often depends on the writer's preference, or, in some cases, the style used by the clinic or organization in which the clinician works. In the test-by-test format, results are organized and discussed in relation to the specific assessments administered (e.g., all results from WISC are discussed in one paragraph, followed by all results from WIAT, etc.). Since results for each separate test are discussed in separate paragraphs, it can be the easiest style to write when compared with other formats. Once results from each test have been discussed, however, all of the main findings must be summarized in one short paragraph at the end of the results section, which can be more challenging when compared with other formats. When using the domain-by-domain format, writers integrate findings under subsections that represent specific domains (e.g. academic performance, oral language, reading, etc.). This format is often used in schools due to its inclusion of academic domains. In the ability-by-ability format, information across tests and observations are integrated, and results are discussed as they relate to specific abilities (e.g. memory, visual-motor, etc.). This style is considered the most difficult to write, and is often used in neuropsychological assessments, as well as in more extensive and thorough learning disability assessments (Lichtenberger et al., 2004).

Recently, Pelco et al. (2009) assessed 104 elementary teachers' preferences for report styles, based on both the format of the report and the use of technical terminology within the report. Three different assessment report styles were used, and each described the same results for a seven-year-old boy. Report models compared included test-by-test technical, theme-based

technical, and theme-based non-technical. The test-by-test technical style included professional terms, and assessment results were organized in a test-by-test fashion, using section headings. The theme-based technical style also included section headings and professional terms, but instead of presenting results in a test-by-test fashion, paragraphs in the results section described distinct related assessment themes, which were underlined and appeared as lead sentences (similar to domain-by-domain, discussed earlier). The theme-based non-technical style was similar to the theme-based style, with the only difference being that it did not include technical terminology. Teachers' ratings for both theme-based reports were significantly higher when compared with test-by-test reports regarding overall readability and comprehension. No significant differences were found between the two theme-based report styles. Based on these findings, they concluded that the structure of the text in psychoeducational reports might be more important to teachers than a decrease in the use of technical terms. Consequently, the results from this study provide further support for the use of domain-based report styles when writing for schools.

Empirical Research on Writing and Using Psychological Reports

Finding effective ways to communicate information gathered from psychological assessments has been a significant goal, for researchers in the fields of both psychology and education, for well over 40 years (e.g. Appelbaum, 1970; Cornwall, 1990; Groth-Marnet & Horvath, 2006; Harvey, 2006; Harvey, 1997; Hoy & Retish, 1984; Miller & Watkins, 2010; Pelco et al., 2009; Snyder, Ritschel, Rand, & Berg, 2006). In general, this body of research has demonstrated that readers prefer, and better understand, reports that utilize concrete, as opposed to abstract, descriptions that emphasize only the most relevant information. When asked about ways to improve communication of psychoeducational assessment results, teachers have

consistently stated that they would like the reports to include descriptions that are clear-cut, concise, and organized into meaningful categories, and that they would like recommendations to be practical and easily implemented (e.g. Brant & Giebink, 1968; Brenner, 2003; Hoy & Retish, 1984; Pelco et al., 2009). Despite these findings, many reports continue to include vague descriptions, unclear or unsuitable recommendations, and/or poorly organized categories, which stresses the continued need to put research into practice (Harvey, 2006; Jordon, Hindes, & Saklofske, 2009; Overton, 2000; Pelco et al., 2009).

Researchers have demonstrated that the psychoeducational report falls short and, on its own, does not provide teachers with recommendations they can easily implement or information that teachers can utilize to create interventions of their own. For example, Gilman and Medway (2007) discovered that, when compared with special education teachers, regular education teachers placed less importance on the recommendations in psychoeducational reports. Moreover, the majority of regular education teachers reported that they “occasionally” comply with the information provided in reports. Special education teachers, on the other hand, claimed that they “often” comply with the information provided, and that the recommendations play an important role in their daily lesson planning. Gilman and Medway stated that these findings might be explained by the similarities between the disciplines of school psychology and special education, the frequent contact between special educators and school psychologists, and the possibility that special educators expect to play a more active role in the development of interventions when compared with regular educators. Another possible explanation for the findings among regular education teachers could be that the suggestions provided in reports are often considered unclear or unsuitable for the regular classroom (Harvey, 2006).

The finding that special education teachers utilize the recommendations in reports is good news for students who meet the requirements for a specific learning disability insofar as they will qualify for an individualized education plan (IEP; Braaten, 2007). Those students, however, who are not eligible for an IEP, are relying on teachers in the regular classroom to implement the appropriate interventions. It is also important to note that, with the rise of inclusive classrooms, general educators are expected to provide appropriate instructional accommodations for students with learning disabilities, and this is increasingly becoming a standard practice within in most classrooms (Berry, 2010). For example, in Nova Scotia, the onus is on general education teachers to accommodate all students in the classroom; more specifically, in Nova Scotia, “Teachers are responsible for teaching all students who are placed under their supervision and care. This includes responsibility for safety and well-being, as well as program planning, implementation, and evaluation. This is not a responsibility that can be transferred or delegated to non-teaching staff” (Nova Scotia Department of Education, 2008). Hence, given that teachers often act as the main link between the student and his/her academic success, it seems reasonable that they should have a clear understanding of how the assessment results apply to the classroom. Since regular educators reported only occasionally using the information provided in the recommendations, the question remains whether the assessment results can be used to assist teachers with this understanding.

When looking at the usefulness of psychoeducational reports with regard to intervention development among teachers, Pelco et. al (2009), discovered that approximately 50% of the teachers in their study were able to create at least one intervention using the assessment results (overall, intervention ideas ranged from zero to three). Three different report styles were used in their study (test-based technical, theme-based technical, and theme-based non-technical), and no

significant differences were found for the number of suitable interventions across the different report styles. Although encouraging, this finding still demonstrated that half of the teachers were unable to use the information to develop teaching strategies and student accommodations based on the information provided in the report. Additionally, they discovered that teaching experience and educational level (Masters degree verses no Masters degree; none of the teachers held degrees in special education or taught special education) was not related to the number of interventions developed. Pelco et al. emphasized the need for continued research regarding ways to communicate assessment results to teachers that allow them to develop their own classroom interventions.

Effectively Communicating Results using a Standard Nomenclature

Difficulties with communication exist, not only between school psychologists and teachers, but also among school psychologists. For example, Harvey (2006) discovered that definitions of average intelligence differed greatly among a sample of 200 clinical psychologists, school psychologists, and counselling psychologists. What's more, 59 of the 200 psychologists even disagreed with the numerical definition of average intelligence. Thus, there is a lack of agreement among psychologists with regard to the meanings of various terms, and explanations of test results often differ, depending on the psychologist (Harvey, 2006). Flanagan, Ortiz, Alfonso, and Dynda (2006) claimed that some reasons for this miscommunication could include a failure to incorporate a well-validated guiding theory, vague and imprecise operational definitions of cognitive abilities, and a lack of a comprehensive, systematic framework for learning disability assessment. Similarly, Harvey (2006) emphasized that test interpretation manuals used by psychologists often include unclear and/or inaccurate term definitions, which sometimes results in a lack of understanding among the general population. Harvey further stated

that, if all test interpretation manuals included the same definitions, it would likely enhance communication among practitioners, educators, and parents.

To combat this problem, the Cattell-Horn-Carroll (CHC) theory of cognitive abilities was employed in this thesis. CHC theory embodies the integration of the influential works of Raymond Cattell, John Horn, and John Carroll (McGrew, 2009). When compared with other prominent theories of intelligence, CHC theory is considered to be the most empirically supported and comprehensive model of cognitive and academic abilities (Alfonso, Flanagan, & Radwan, 2005; Flanagan, Ortiz, & Alfonso, 2007; McGrew, 2009). In short, the descriptions of the structure of CHC cognitive abilities are supported by structural evidence that stems from over 60 years of research in the psychometric tradition (Flanagan et al., 2007). According to McGrew (2009), CHC theory has helped (and continues to help) fill in the gap between theory and practice with regard to cognitive assessment development and interpretation. Currently, the majority of intelligence test developers recognize the value of applying CHC theory to descriptions and interpretations of cognitive ability constructs, and several modern assessments have been either created, or revised, with a CHC-based approach in mind (Alfonso et al., 2005). For example, both the Woodcock Johnson (WJ-III) and the Stanford Binet Intelligence Scales (SB-IV) were created with CHC theory as a blueprint (Flanagan et al., 2007). Furthermore, CHC-theory is increasingly being applied to research on relationships between cognitive abilities and academic achievement outcomes (e.g. Benson, 2008; Evans, Floyd, McGrew, & Leforgee, 2002; Floyd, Bergeron, & Alfonso, 2006; Floyd, Evans, & McGrew, 2003). To gain a clear understanding of how CHC theory was used in this study, it is essential to describe how the theory developed, as well as the elements on which it is built.

The Works of Raymond Cattell, John Horn, and John Carroll

According to Alfonso et al. (2005) and Miller (2008), in 1941, Raymond Cattell proposed two types of intelligence. The first type of intelligence proposed was fluid intelligence (Gf): inductive and deductive reasoning abilities. Factors believed to influence fluid intelligence include biology and learning through interactions with the environment. The second type of intelligence proposed was crystallized intelligence (Gc): abilities that reflect knowledge of facts and formerly attained skills that are learned through cultural experiences.

Alfonso et al. (2005) and Miller (2008) further explained that, in the 1960s, John Horn extended Cattell's Gf-Gc model to include five additional abilities: visual processing (Gv), short-term memory (Gsm), long-term storage and retrieval (Glr), speed of processing (Gs), and auditory processing (Ga). In the 1990s, Horn added factors representing decision speed (Gt) and quantitative knowledge (Gq). The Cattell-Horn Gf-Gc model became complete after adding the final ability, facility with reading and writing (Grw; based on the work of Woodcock, 1994).

As stated by Alfonso et al. (2005), in the 1990s, John Carroll conducted an influential review of the world's literature on human cognitive abilities. After reviewing over 400 research studies, Carroll proposed the three-stratum model of cognitive abilities, which consisted of three strata, ranging from the broadest ability to the narrowest abilities. Stratum III represented the broadest or most general intellectual ability, which subsumed stratum II and I. Stratum II, the broad level, included eight broad cognitive abilities, including the two original factors of fluid and crystallized intelligence. Broad abilities represented the basic long lasting traits of individuals that influence behaviours in various situations. For example, the extent and depth of a person's acquired knowledge (broad ability of crystallized intelligence) can have a major

influence on how he or she handles various situations, namely because a person's problem solving methods tend to stem from previous experiences or education. Lastly, stratum I, the specific level, included a large number of specific factors grouped under stratum II. Carroll's three-stratum theory was combined with Cattell-Horn Gf-Gc theory and became known as Cattell-Horn-Carroll theory (commonly recognized as CHC theory). CHC theory consists of the three strata: general, broad, and specific abilities. Work from all three theorists has been integrated, resulting in nine broad cognitive abilities, and more than 70 narrow cognitive abilities (for a complete listing, see Appendix A).

Purpose and Rationale of Study

The purpose of this study was to assess the effectiveness of supplementing the psychoeducational report with a CHC-based listing of a student's strengths and areas of difficulty. The cognitive abilities depicted in the listing were obtained from the assessment results presented in an illustrative case report in *Essentials of WJ III Tests of Achievement Assessment* by Mather, Wendling, and Woodcock (2001). The listing included all nine academic/cognitive broad cognitive abilities, along with relevant narrow abilities and their definitions. The cognitive abilities and their definitions were taken from *Essentials of Cross-Battery Assessment* by Flanagan et al. (2007), which are based on the integration of writings of several experts in CHC theory and research (for a more detailed description of the CHC-based listing, see 'materials' section)

Since teachers would prefer the information in assessment reports to be presented in meaningful groupings (Brenner, 2003; Pelco et al., 2009), the listing included two specific categories: strengths and areas of difficulty. Based on the finding that teachers would like reports

to include brief descriptions that are to the point, all narrow abilities were described in one sentence. Although the summary section generally provides a brief review of the findings, teachers must still sort through several paragraphs to find the information required to plan lessons. Consequently, when the listing is available, there should likely be no need to search through the summary and/or results section(s), insofar as the listing provides similar information, but in a format that should make the details easier to locate.

This study was designed to test the following hypotheses. Since some readers prefer to use the quickest method of finding required information (Lichtenberger et al., 2004), it was expected that, when the supplemental listing was available, teachers would consider this section to be more helpful than other sections in the report. Also, since teachers should potentially spend less time searching for the information in the report, it was predicted that, when the listing was available, they would have more time to focus on developing intervention ideas and, thus, formulate more interventions. For the same reasons, it was hypothesized that, overall, teachers would be more satisfied with the way information was presented in the report when it was supplemented with the listing.

Method

Participants

Participants included forty-two elementary-level (grades primary through to six) teachers in Nova Scotia, Canada. The experimental group was comprised of 20 teachers and the control group was comprised of 22. The mean number of years of teaching experience for participants was 9.7 years, with a minimum of two years and a maximum of 30 years. Approximately 7% of the participants were aged 26 years or under, 64% were between the ages of 27 and 39 years, and

29% were aged 40 years or over. Eighty-six percent were female, 28% had earned a Masters degree, and 14% held degrees in special education. Seventeen percent taught only/mostly students with learning difficulties, 19% taught about the same number of students both with and without learning difficulties, and 66% taught only/mostly students without learning difficulties. Lastly, 10% identified as part-time teachers, 7% identified as long-term substitute teachers, and the remaining 83% were full-time teachers.

Materials

The report used for both the experimental and control groups was taken from an illustrative case report presented in *Essentials of WJ III Tests of Achievement Assessment* by Mather et al. (2001), describing results for an 11-year old boy in fifth grade. Results in the illustrative report were based on Woodcock-Johnson III (WJ III; Test of Cognitive Abilities and Tests of Achievement) and Informal reading inventory. Sections in the report included: Background Information, Observations during Evaluation, Assessment Results, and Summary. The experimental report also included an “Overview of Strengths and Areas of Difficulty” (i.e. the CHC-based listing). The “Recommendations” section was not included because participants were asked to generate their own teaching strategies and student accommodations based on the information in the report.

When reporting assessment results, it is important to write in a way that will be meaningful for the intended audience (Mather et al., 2001). It is suggested that, when writing reports for teachers and parents, it is best to focus on children’s abilities, rather than test scores, namely because this form of writing can be more readily understood by non-clinicians and, perhaps most importantly, the results communicated are about the person, not merely the scores.

(Lichtenberger et al., 2004). One way to accomplish this individual-focused form of communication is to use descriptive classifications, or verbal rank ranges, of cognitive abilities (e.g. Below Average), instead of test scores (Lichtenberger et al., 2004; Mather et. al., 2001). Hence, verbal label rank ranges were used in the current study to describe cognitive abilities in the psychoeducational report.

Since psychoeducational reports are written for a variety of readers with different levels of educational backgrounds (e.g. teachers, as well as parents), it is suggested that reports be tailored to an 8th grade reading level, which has been found to be appropriate for most adults (Miller & Watkins, 2010; Pelco et al., 2009). Therefore, the language used in the report was adjusted to an 8th grade-reading level using the Flesch-Kincaid Grade-Level Readability Formula on Microsoft Office Word 2007. The readability formula was based on length of words, sentences, and paragraphs. According to Hirst (2003), it is acceptable to use technical language when it improves understanding, though it should still be used sparingly. Consequently, any technical language required to describe important information was not adjusted using the readability formula.

The only difference between the experimental report and the control report was the inclusion of the supplemental listing including CHC-based descriptions of the student's strengths and areas of need. The listing included all nine broad cognitive/academic abilities, which was in the form of major headings, and followed by the overall verbal label rank range (e.g. Average, Above Average). All of the relevant narrow abilities (i.e. those abilities that were tested) were listed underneath their related broad abilities, either under the subheading of 'Detailed Strengths' or 'Detailed Areas of Difficulty'. All narrow abilities were defined in one sentence, and preceded by the verbal label rank range (for supplemental table, see Appendix B). Verbal label rank ranges

were determined using the descriptive category system recommended for WJ-III (Mather et al., 2001).

To ensure the psychoeducational report was valid, five practicing school psychologists and one recent school psychology graduate read the report and identified any inappropriate terms, or descriptions, and then either agreed or disagreed that the report was realistic and similar to typical reports. Adjustments continued to be made to the report until there was substantial agreement among the professionals (adapted from Miller & Watkins, 2010).

Instruments

To assess whether teachers formulated more interventions when the report was supplemented with the listing, participants answered five open-ended questions based on developing their own teaching strategies (see Appendix C). Each question pertained to a specific type of school assignment (e.g. reading activity, class presentation). Participants were asked to formulate as many interventions as possible based on the assessment results. Participants did not have to provide a response if they thought that there was not enough information provided to create an intervention for a specific type of assignment. The average number of interventions was calculated for both the experimental group and the control group. To prevent bias in scoring, four practicing school psychologists and one recent school psychology graduate reviewed the interventions created by participants, and verified whether they were appropriate for the student based on the assessment results. Interventions were considered appropriate when there was substantial agreement among the professionals (for consent form, see Appendix F).

To measure the areas of the report that were considered to be most helpful when formulating interventions, teachers in the experimental group rated each report section for degree

of helpfulness on a 7-point Likert scale (1 = not at all helpful to 7 = extremely helpful). Using a 6-point Likert scale, teachers in both groups rated their overall level of satisfaction with the way the information was presented in the report (1 = extremely dissatisfied to 6 = extremely satisfied).

Design and Procedure

A between subjects, post-test design was used in this study. Participants were randomly assigned to experimental and control groups. To allow participants to complete the study at their convenience, they received an email containing the psychoeducational report as an attachment. Participants were directed to either print off the report or leave it open in a separate window on their computer throughout the study. Participants had the option of having a hard copy of the report sent to them via postal mail. The body of the email explained to participants that they were being asked to volunteer to help school psychologists learn how to improve communication of test results, and that the purpose was to help teachers use the information to develop classroom interventions. This was followed by a brief description of the study, as well as a direct link to the online survey. Once participants clicked on the direct link to the study, they were directed to the consent form (see Appendix E). They were informed that, by clicking on continue, they were agreeing to the terms of consent. Demographic questions were asked first (forced-choice format). Once demographic questions were answered, participants were informed that they would need to use the information provided in the report to answer the remaining questions. They were asked to read the report as if it described a student in their class. Five types of school assignments requiring specific teaching strategies and student accommodations were presented (open-ended question format). Participants were directed to use the information in the reports to formulate as many interventions as possible to help the student complete each school assignment, unless they

thought that there was not enough information provided, in which case, they did not provide a response. The questions were based on information located both in text as well as in the supplemental listing. To ensure participants had a clear understanding of the requirements, five sample interventions for a specific type of assignment were provided before developing interventions on their own (example was based on findings that were unrelated to those in the report provided). Participants then rated their overall level of satisfaction with the way the information was presented in the report, as well as the degree of helpfulness of each report section.

Before commencing the main study, five teachers participated in a pilot study in which they completed the full online questionnaire, to ensure the test questions were understandable (participants were provided with a comment box at the end of the study).

Results

Coehen's Kappa was used to ensure agreement among school psychologists regarding the validity of the overall report. After revising the report based on suggestions provided by school psychologists, kappa reached .1 and, thus, the report was considered realistic and comparable to typical reports. Coehen's Kappa was also used to ensure that the interventions generated were appropriate. Kappa reached .75 and, hence, interventions created by teachers were considered appropriate.

To assess whether teachers formulated more interventions when the report was supplemented with the CHC-based listing of strengths and areas of difficulty, an independent t-test was used to compare the average number of interventions formulated for the experimental group (report with supplemental listing) and the control group (report without supplemental

listing). No significant differences were found for the number of interventions created between the two groups ($p = .232$). Teachers in the experimental group provided an average of 10 appropriate interventions and teachers in the control group provided an average of 7 appropriate interventions. Overall, approximately 55% of all teachers provided at least six different appropriate interventions using the information provided in the report.

An independent t-test revealed a significance difference between satisfaction ratings for both groups ($t = -2.58, p = .013$). On a scale from 1 (extremely dissatisfied) to 6 (extremely satisfied), teachers in the experimental group provided an average satisfaction rating of 4.10, whereas teachers from the control group provided an average rating of 3.23. A Likert scale was used to determine the most helpful section when creating interventions. On a scale from 1 (not at all helpful) to 7 (extremely helpful), teachers in the experimental group provided the highest helpfulness ratings for the supplemental “strengths and areas of difficulty” section (mean rating = 4.15) and the “summary” section (mean rating = 4.00). Average ratings for all other sections were below 4 (results = 3.45, observations = 3.0, background information = 2.85). Teachers in the control group provided the highest ratings for the “summary” section (mean rating = 3.14) and the “results” section (2.95). Teachers in this group provided an average rating of 2.41 for both the “observations” section and the “background information” section.

To determine the main effects for report type and teaching experience, a median split (median = 7) was used to divide participants into two experience levels (more experienced, $n = 19$, versus less experienced, $n = 23$), after which a 2 (group) x 2 (teaching experience) ANOVA was calculated, using the mean number of interventions created as the dependant variable. There were no main effects for report type, $F(1, 44) = 1.100, p = .301$, or teaching experience, $F(1, 44) = .758, p = .389$, nor was an interaction found, $F(1, 44) = .247, p = .622$.

Using the number of interventions developed as the dependant variable, a 2 (group) x 2 (educational background) ANOVA was used to determine the main effects for report type and educational background (i.e. graduate degree verses no graduate degree). No main effects were revealed for report type, $F(1, 44) = .526, p = .473$, or educational background, $F(2, 44) = .221, p = .641$, nor was there a significant interaction, $F(1, 44) = .273, p = .604$. Also using the number of interventions developed as the dependant variable, a 2 (group) x 2 (student population taught) ANOVA was calculated to determine main effects for report type and student population taught (i.e. little or no experience teaching students with learning difficulties verses moderate to extensive experience). There were no main effects for report type, $F(2, 44) = .618, p = .437$, or student population taught, $F(1, 44) = .005, p = .942$, and no interaction was found, $F(1, 44) = 1.794, p = .188$.

To assess teachers' thoughts about psychoeducational reports in general and/or the one presented in the study, teachers were provided with a comment box at the end of the study. The open-response item brought forth comments conveying frustration with regard to amount of psychological jargon generally used, the lack of clear-cut, brief descriptions of cognitive abilities, and the need for recommendations that are specific and realistic. Comments that conveyed satisfaction centered on reading reports that are organized, thorough and/or contain a quick reference to the results (see Appendix G for complete list of comments).

Discussion

The purpose of this study was to assess the effectiveness of supplementing the psychoeducational report with a CHC-based listing of a student's strengths and areas of difficulty. It was hypothesized that supplementing the report with the listing would increase

teachers' ability to develop academic interventions. That hypothesis was not supported. Similar to the findings of Pelco et al. (2009), approximately 55% of all teachers in the current study developed appropriate intervention ideas, which, although promising, still reveals that almost half of the teachers were unable to use this information to create even one intervention for the student. Approximately 53% of the teachers in the study conducted by Pelco et al. developed at least one appropriate intervention, whereas a little over half of the teachers in the current study developed at least six interventions. It is important to note that, in the study conducted by Pelco et al., teachers were assessed in groups at the start of the school day and they read a report and developed interventions within 15-30 minutes. In the current study, teachers completed the study online and were sent the report via email as an attachment, which provided them with the option of reading the report before commencing the study. Additionally, teachers in the study by Pelco et al. were asked to suggest intervention ideas based solely on the information provided in the report. Although teachers in the current study were also asked to create intervention ideas based on information provided in the report, they were also asked to tailor intervention ideas to five different academic activities. These differences in methodology may explain the increase in number of interventions developed in the current study, when compared with the study of Pelco et al.

Similar to the findings of Pelco et al. (2009), no relationship was revealed between the number of interventions developed and years of teaching experience or educational background (i.e. graduate degree verses no graduate degree). These findings were not unexpected, given that there are no research findings to date that support these types of relationships (Pelco et al., 2009). Special education teachers have been found to utilize the information in psychoeducational assessment reports more when compared with regular education teachers (Gilman and Medway,

2007). Results, however, from the current study revealed no relationship between level of teaching experience with students with learning difficulties and the number of interventions developed, regardless of report type. Hence, it appears that a gap exists, not only between school psychology and regular education, but also between school psychology and special education.

It was hypothesized that teachers would be more satisfied with the psychoeducational report that contained the supplemental CHC-based table. This hypothesis was supported. On a scale from 1 to 6, teachers in the experimental group provided a mean rating of 4.10, whereas teachers in the control group provided a mean rating of 3.23. Similarly, when asked about the degree of helpfulness of each section on a scale from 1 to 7, mean ratings among the experimental group for both the “summary” section and the supplemental section were higher than any ratings provided by the control group (experimental mean “supplemental” rating = 4.15; experimental mean “summary” rating = 4; control mean summary rating = 3.14). Hence, although the supplemental CHC-based table did not appear to help teachers to develop more interventions, it did prove to be the most helpful section, and it provided teachers with a significantly higher level of overall satisfaction with the report, when compared with the control group, which has been a large part of the aim of research in this area for well over four decades (e.g. Brant & Giebink, 1968; Brenner, 2003; Hoy & Retish, 1984; Pelco et al., 2009). Nevertheless, it is important to note that, although teachers were more satisfied with the report when it contained the supplemental table, the average satisfaction rating provided was still within the middle range of the scale (i.e. mean = 4.10 on a scale from 1 to 6). Therefore, it seems that, although this supplemental table may be a step closer to what teachers require to better understand, and make practical use of, assessment results, it may not be the key to filling in the gap between psychoeducational assessment and educational practice.

Possible Reasons for the Gap between the Fields of School Psychology and Education

As said by Harvey (2006), part of the problem with psychological assessment report writing stems from psychology graduate programs. In a study conducted by Harvey, recent graduates from a university-based program were asked which factors they believe contribute to “difficult-to-read” assessment reports. Results indicated that they believed that they were not taught how to clearly explain data and numbers when presenting them in reports; they were taught to focus more on results and scores in general, instead of taking a more person-centered approach to report writing; and, although they were taught to utilize psychological language appropriately, they did not learn techniques to clearly and concisely integrate these descriptions and explanations into reports. Hence, it appears that graduate-level training programs do not effectively address ways to write reports that are comprehensible and meaningful to non-psychologists. Additionally, as indicated by Pelco et al. (2009) and Harvey (2006), graduate-level psychology students may not be adequately exposed to empirical literature focused on report writing or provided with enough opportunities to practice writing reports and receive appropriate feedback. What's more, according to Mastoras et al. (2011), it is unlikely that this feedback will come directly from the most probable readers: teachers.

This lack of feedback, however, appears to extend beyond graduate school. In a study conducted by Jordan, Hindes, and Saklofske (2009), surveys were sent out to psychologists working within the schools in Canada (e.g. school psychologists, educational psychologists, etc.). When asked how often they receive feedback and/or evaluation for their services, out of 181 respondents, 48% stated they “Rarely” receive feedback *or* evaluation, 41% stated that they “Occasionally” receive feedback *and* evaluation, and 33% stated that they “Often” receive evaluation. Hence, it seems that one way to fill in at least a small portion of the gap between

psychoeducational assessment and educational practice might be to find ways for teachers to provide school psychologists with feedback on their reports. Finding time for thorough feedback may be a challenging task, given the busy schedule of both professions; yet, this task seems worth the challenge, particularly in light of the vital role psychoeducational reports can play in students' lives.

As stated by Stoiber and Kratochwill (2000), another problem might be that, despite time-honoured research in the area of report writing, it seems that many psychologists continue to utilize report writing practices that are not based on research. Combined, all of the aforesaid findings highlight the importance of ensuring that both graduate-level students and practicing school psychologists are aware of and appreciate research findings regarding the common difficulties with these reports and, perhaps most importantly, that they are engaging in evidence-based practices.

The gap between psychoeducational assessment and educational practice may also be influenced by the training provided to teachers. In order for teachers to successfully support students with learning difficulties, they must be knowledgeable of the empirical literature focused on effective instructional practices and spend sufficient time building on and practicing skills related to making appropriate instructional decisions and accommodating various needs (Hawkins, Kroeger, Musti-Rao, Barnett, & Ward, 2008). Since the rise of inclusive classrooms, the role of the general education teacher has gone through substantial change (Hunt, Soto, Maier, Liboiron, & Bae, 2004) and, according to Anderson (2006), teachers sometimes feel unprepared when interacting with students with learning disabilities. It seems that, for the most part, teachers receive little training focused on the development of interventions for use in the inclusive setting, and for students with learning difficulties (Anderson, 2006; Hunt et al., 2004).

On the topic of *response to intervention* (RTI; a system for offering assistance and interventions to all students), Hawkins et al. (2008) expressed the need for increased involvement of pre-service teacher training programs to ensure that their roles in relation to RTI are understood and put into practice (which includes knowing and providing effective instructional strategies for students with learning difficulties). In a study conducted by Greenfield, Rinaldi, Proctor, and Cardarelli (2010), teachers' perceptions of RTI were evaluated, after which concerns relating to intervention development were noted among both groups of teachers. Specifically, teachers expressed no difficulties with initial target instructional practices, but the challenges appeared to arise in cases where students failed to show improvement. In these situations, teachers reported difficulties in determining what types of instructional changes to make (i.e. the most suitable empirically-supported instructional practices and the extent of change required). Thus, it appears that these findings lend more support for an increased focus on intervention development in university programs and professional development for teachers. Likewise, even more support for this type of training stems from the findings of both the current study and the study conducted by Pelco et al. (2009), both of which revealed that approximately half of the teachers involved were unable to use the information provided in a psychoeducational report to develop even one intervention for the student described.

According to Harvey (2006), and as mentioned previously, another problem in this area relates to the language used in assessment report writing handbooks, test manuals, and psychology textbooks. Harvey explained that many of the terms used in these books are not clearly defined and, thus, are difficult to comprehend. Furthermore, she stated that many psychologists disagree with explanations and definitions of various terms commonly used in assessment reports, such as the terms "learning disability" and "average intelligence". Flanagan,

Ortiz, Alfonso, and Dynda (2006) stated that one way to avoid confusion and/or disagreement among professionals might be to adopt a standard nomenclature in the field of learning difficulties that incorporates a well-validated guiding theory and includes clear-cut and precise operational definitions of cognitive abilities.

Additionally, it is important to note that, although school psychologists have been traditionally regarded as “educational assessors”, they now dedicate a substantial amount of their time to an array of other services as well, such as counselling, consultation, prevention/intervention, and educational programming (Corkum, French, & Dorey, 2007; Hann, 2001; Jordon, Hindes, & Saklofske, 2009). For example, in Nova Scotia, school psychologists dedicate about half of their time to services related to psychoeducational assessment, and the rest of their time is generally dedicated to the following services (in order from most to least amount of time): “consultation with school personnel, behavioural assessments, individual counselling, in-servicing, consultation with mental health professionals, prevention, supervision, and group counselling” (Corkum, French, & Dorey, 2007). For this reason, the clarity of communication of assessment results might also be influenced by the time required to write reports. In a study conducted with some members of the National Association of School Psychologists, Harvey discovered that 33% of respondents wrote reports on a weekly basis and 89% wrote reports at least monthly. In addition, many respondents stated that the time they spend on report writing often interferes with time for providing other services (e.g. counselling, consultation, etc.) and some even stated that they spend time writing reports at home during evenings and/or weekends. Harvey concluded that, in short, many psychologists do not appear to have additional (or sometimes even enough) time to write and then revise reports in order to make them more comprehensible for non-psychologists.

Overall, there appears to be a need for more research on ways to improve psychoeducational reports for teachers. Over the past four decades, researchers have demonstrated that readers prefer, and better understand, reports that use specific, as opposed to abstract, descriptions, and that teachers have consistently stated that they would prefer to read reports that organize descriptions into meaningful categories and use language that is clear-cut and to the point (e.g. Appelbaum, 1970; Cornwall, 1990; Groth-Marnet & Horvath, 2006; Harvey, 2006; Jordon, Hines, & Saklofske, 2009; Miller & Watkins, 2010; Overton, 2000; Pelco et al., 2009; Snyder et al., 2006). Yet, despite this consistent call for change, these issues continue to exist. In fact, based on the comments provided by ten of the 42 teachers in the current study, six expressed dissatisfaction with the way information is typically presented (e.g. explanations/descriptions that are unclear and/or too lengthy). For example, one teacher, who was provided with a report with no supplemental CHC-based table, stated that it was too difficult to create interventions without a clear-cut description of what the student can and cannot actually do, while another teacher from the same group commented that it might be visually better to present the results in a chart format so that teachers can clearly see the results and easily refer back when needed.

Limitations

Drawbacks in the current study included small sample sizes and low return rate. Approximately 200 email invitations were sent out to teachers across three school boards in Nova Scotia, and an invitation to participate was advertised in a newsletter distributed by the local Teacher's Union. The study was run during the end of the school year (i.e. from February to June), and required an average time commitment of 20 minutes, which may have influenced the overall return rate. Furthermore, since the current study relied on volunteer participants

within Nova Scotia, who were able to make this time commitment, the results are limited in their generalizability to all teachers. Another important limitation to this study relates to the assessment report. While efforts were made to ensure that the report used was similar to typical reports written by school psychologists, the resulting report may have actually been of higher quality when compared with reports teachers generally read insofar as the report was revised based on several suggestions, provided by school psychologists, to improve the overall presentation. Moreover, since the report was based on a fictitious student, the motivation to understand the information presented and use it to create interventions may not reflect the actual motivation to do so when reading a report describing a student known to them. Lastly, it is important to note that, in actual practice, teachers are generally provided with the opportunity to talk about assessment results with the school psychologist in order to clarify any confusion and ask questions.

Future Research

Continued research on ways to improve communication between school psychologists and teachers seems evident. Perhaps most importantly, it may be valuable for future researchers to focus on and address the complaints and suggestions provided by teachers. This research would seem particularly important in view of the important role teachers are expected to play in the classroom. Given the amount of time school psychologists spend writing psychoeducational reports, it may be beneficial for future researchers to explore how school staff utilize assessment reports to guide curriculum-based problem-solving, and how the information required to guide these decisions may differ depending on the level of schooling (i.e. elementary-, middle-, and high-school).

To aid with gaining a better understanding of the reasons for the gap between the fields of school psychology and education, a thorough examination of the courses offered to help prepare both school psychologists and teachers for their future relationship may be warranted. It may also be interesting to investigate whether some university programs offer courses or workshops on assessment and intervention that are custom-made for students in education and school psychology and provide the two future professions with opportunities to interact and share ideas.

In honour of the saying “practice what you preach” (or, in this case, perhaps “preach what you have practiced”), it may be interesting to investigate whether or not there is a difference in the overall usefulness of psychoeducational reports when written by school psychologists who either have some teaching experience (e.g. experience as a remedial teacher or a tutor for students with learning disabilities), have had formal teacher training (e.g. hold a Bachelor of Education), or have both teaching experience and formal teacher training.

Lastly, even though the CHC-based listing used in the current study did not appear to help teachers develop more interventions, it did increase the overall level of satisfaction with the way the information was presented in the report. Hence, given that teachers have little time to devote to reading psychoeducational reports, and if researchers carried out another study similar to this one, it may be interesting to assess whether or not teachers spend less time developing interventions when provided with a CHC-based listing of a student’s strengths and areas of difficulty.

Implications

One main implication resulting from these findings is that teachers’ complaints and suggestions regarding psychoeducational reports be addressed in the report writing process. In

the same way that school psychologists may benefit from having a better understanding of what teacher's require to make change in the classroom, it may be beneficial to ensure that teachers receive appropriate training relating to the development and use of interventions, both in university preparatory programs and through professional development. University programs in the field of education and school psychology are in the unique position to provide opportunities to pool resources, namely by uniting knowledge and skills from both disciplines. Schools may also benefit from universities insofar as practicum and/or intern students from both fields could share knowledge and techniques gained from current research via workshops and/or professional development within the schools. Lastly, one key implication of the current results is that it seems vital to ensure there is a connection between practicing school psychologists and teachers, not only to aid with communication, but also to utilize the skills of both professions collectively.

Concluding Remarks

In sum, the results from this study revealed a significant increase in teacher satisfaction when the report was supplemented with a brief listing the student's strengths and areas of difficulty. Additionally, two teachers commented that the supplemental table was helpful insofar as it served as a quick reference to the results. Accordingly, these findings provide some support for the usefulness of including a supplemental section specifically designed for teachers. Recognizing and addressing the concerns and requests of teachers may help to create a report that is truly teacher-friendly. In essence, by providing teachers with information that can be effectively related to classroom instructional practices, students are provided with a better chance of reaching their academic potential, which, in effect, is the ultimate goal of psychoeducational assessment in the schools.

As a final note, the main role of psychologists working in the schools is to provide assistance in the academic planning and programming process (Nova Scotia Department of Education, 2009). Thus, school psychologists play a crucial role in supporting students' cognitive, academic, and emotional growth. From this perspective, it seems essential that teachers and school psychologists collaborate in order to determine the best practices to help students achieve academic success.

References

- Alfonso, V.C., Flanagan, D.P., & Radwan, S. (2005). The impact of the Cattell-Horn-Carroll theory on test development and interpretation of cognitive and academic abilities. In D.P. Flanagan & P.L. Harrison (Eds.), *Contemporary Intellectual Assessment: Theories, Tests, and Issues* (2nd ed., pp.185-202). New York: Guilford Press.
- Anderson, M.J. (2006). Try a disability on for size: Sensitizing school personnel. *Georgia School Counselors Association Journal*, 13, 31-40.
- Appelbaum, S.A. (1970). Science and persuasion in the psychological report. *Journal of Consulting and Clinical Psychology*, 35(3), 349-355.
- Bell, S.M. (2002). Psychoeducational Assessment: How to read, understand, and use psychoeducational reports. In Lindop, M. (Ed.). *Keys to effective LD teaching practice* (p. 24-26). Knoxville, Tennessee: Center for Literacy Studies, the University of Tennessee.
- Benson, N. (2008). Cattell Horn Carroll cognitive abilities and reading achievement. *Journal of Psychoeducational Assessment*, 26(1), 27-41.
- Berry, R. A.W. (2010). Preservice and early career teachers' attitudes towards inclusion, instructional accommodations and fairness: Three profiles. *The Teacher Educator*, 45, 75-95.
- Braaten, E. (2007). *The child clinician's report-writing handbook*. New York: The Guilford Press.
- Brandt, H.M. & Giebink, J.W. (1968). Concreteness and congruence in psychologists' reports to teachers. *Psychology in the Schools*, 5(1), 87-89.

- Brenner, E. (2003). Consumer-focused psychological assessment. *Professional Psychology: Research and Practice, 34*(3), 240-247.
- Byrnes, M.A. (2008). Educators' interpretations of ambiguous accommodations. *Remedial and Special Education, 29*(5), 306-315.
- Corkum, P., French, F., & Dorey, H. (2007). School psychology in Nova Scotia: A survey of current practices and preferred future roles. *Canadian Journal of School Psychology, 22* (1), 108-120.
- Cornwall, A. (1990). Social validation of psychoeducational assessment reports. *Journal of Learning Disabilities, 23*(7), 413-416.
- Evans, J. J., Floyd, R. G., McGrew, K. S., & Leforgee, M. H. (2002). The relations between measures of Cattell-Horn-Carroll (CHC) cognitive abilities and reading achievement during childhood and adolescence. *School Psychology Review, 31* 246-262.
- Flanagan, D. P., Ortiz, S. O., Alfonso, V. C., & Dynda, A. M. (2006). Integration of response to intervention and norm-referenced tests in learning disability identification: Learning from the tower of Babel. *Psychology in the Schools, 43*(7), 807-825.
- Flanagan, D.P., Ortiz, S.O., & Alfonso, V.C. (2007). *Essentials of cross battery assessment* (2nd ed). Hoboken, New Jersey: John Wiley & Sons, Inc.
- Floyd, R. G., Bergeron, R., & Alfonso, V. C. (2006). Cattell-Horn-Carroll cognitive ability profiles of poor comprehenders. *Reading and Writing: An Interdisciplinary Journal, 19*, 427-456.
- Floyd, R. G., Evans, J. J., & McGrew, K. S. (2003). Relations between measures of Cattell-Horn-Carroll (CHC) cognitive abilities and mathematics achievement across the school-age years. *Psychology in the Schools, 40*(2), 155-171.

- Gilman, R. & Medway, F.J. (2007). Teacher's perceptions of school psychology: A comparison of regular and special education teacher ratings. *School Psychology Quarterly*, 22(2), 145-161.
- Greenfield, R., Rinaldi, C., Proctor, C.P., & Cardarelli, A. (2010). Teachers' perceptions of a response to intervention (RTI) reform effort in an urban elementary school: A consensual qualitative analysis. *Journal of Disability Policy Studies*, 21(1), 47-63.
- Groth-Marnat, G., & Horvath, L.S. (2006). The psychological report: A review of current controversies. *Journal of Clinical Psychology*, 62(1), 73-81.
- Hann, S.G. (2001). School psychology in Nova Scotia. *Canadian Journal of School Psychology*, 16, 19-24.
- Harvey, V.S. (1997). Improving readability of psychological reports. *Professional Psychology: Research and Practice*, 28(3), 271-274.
- Harvey, V.S. (2006). Variables affecting the clarity of psychological reports. *Journal of Clinical Psychology*, 62(1), 5-18.
- Hawkins, R.O., Kroeger, S.D., Musti-Rao, S., Barnett, D.W., & Ward, J.E. (2008). Preservice training in response to intervention: Learning by doing an interdisciplinary field experience. *Psychology in the Schools*, 45(8), 745-762.
- Hirst, R. (2003). Scientific jargon, good and bad. *Journal of Technical Writing and Communication*, 33(3), 201-229.
- Hoy, M.P. & Retish, P.M. (1984). A comparison of two types of assessment reports. *Exceptional Children*, 51(3), 225-229.

- Hunt, P., Soto, G., Maier, J., Liboiron, N., & Bae, S. (2004). Collaborative teaming to support preschoolers with severe disabilities who are placed in general education early childhood programs. *Topics in Early Childhood Special Education, 24*(3), 123-142.
- Jordan, J., Hindes, Y., & Saklofske, D.H., (2009). School psychology in Canada: A survey of roles, functions, challenges and aspirations. *Canadian Journal of School Psychology, 24*(3), 245-264.
- Lekwa, A. & Ysseldyke, J. (2010). Dissertation research in school psychology: Changes in topics and methodology over the past 25 years. *Journal of Applied School Psychology, 26*(1), 17-37.
- Lichtenberger, E.O., Mather, N., Kaufman, N.L., & Kaufman, A.S. (2004). *Essentials of assessment report writing*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Mastoras, S.M., Climie, E.A., McCrimmon, A.W., & Schwean, V.L. (2011). A C.L.E.A.R. approach to report writing: A framework for improving the efficacy of psychoeducational reports. *Canadian Journal of School Psychology, 26*(2), 127-147.
- Mather, N., Wendling, B.J., & Woodcock, R.W. (2001). *Essentials of WJ III tests of achievement assessment*. New York: John Wiley & Sons, Inc.
- McGrew, K. (2009). CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of psychometric intelligence research. *Intelligence, 37* (1), 1-10.
- Michaels, M.H. (2006). Ethical considerations in writing psychological reports. *Journal of Clinical Psychology, 62*(1), 47-58.
- Miller, B.D. (2008). Cattell-Horn-Carroll (CHC) theory-based assessment with deaf and hard of hearing children in the school setting. *American Annals of the Deaf, 152*(5), 459-466.

- Miller, J. A., & Watkins, M. W. (2010). The use of graphs to communicate psychoeducational test results to parents. *Journal of Applied School Psychology, 26*(1), 1-16.
- Nova Scotia Department of Education (2001). *Report of the Special Education Implementation Review Committee*. Halifax, NS: Province of Nova Scotia
- Nova Scotia Department of Education, Student Services (2008). *Special Education Policy*. Retrieved from <http://www.ednet.ns.ca/pdfdocs/studentsvcs/specialed/speceng.pdf>
- Nova Scotia Department of Education, Student Services (2009). *School Psychology Guidelines*. Retrieved from http://www.ednet.ns.ca/pdfdocs/studentsvcs/School_Psych_Guide.pdf
- Overton, T. (2000). *Assessment in special education: An applied approach* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Pelco, L.E., Ward, S.B., Coleman, L., & Young, J. (2009). Teacher ratings of three psychological report styles. *Training and Education in Professional Psychology, 3*(1), 19-27.
- Reschly, D.J. & Ysseldyke, J.E. (2002). Paradigm shift: The past is not the future. In A. Thomas & J. Grimes (Eds.), *Best Practices in School Psychology IV* (pp 3-20). Bethesda, MD: NASP Publications.
- Snyder, C.R. Ritschel, L.A., Rand, K.L., & Berg, C.J. (2006). Balancing psychological assessments: Including strengths and hope in client reports. *Journal of Clinical Psychology, 62*(1), 33-46.
- Stoiber, K.C. & Kratochwill, R.R. (2000). Empirically supported interventions and school psychology: Rationale and methodological issues-part 1. *School Psychology Quarterly, 15*(1), 75-105.

Woodcock, R.W. (1994). Measures of fluid and crystallized intelligence. In R.J. Sternberg (Ed.), *Encyclopedia of Human Intelligence* (pp. 452-456). New York: Macmillan.

Appendix A

CHC Broad and Narrow Abilities

Fluid Reasoning	Crystallized Reasoning (Comprehension)	Quantitative Knowledge	Reading and Writing	Short-term Memory	Visual Processing	Auditory Processing	Long-term Storage & Retrieval	Processing Speed
General sequential reasoning	Language development	Mathematical knowledge	Reading decoding	Memory span	Spatial relations	Phonetic coding: analysis	Associative memory	Perceptual speed
Induction	Lexical knowledge	Mathematical achievement	Reading comprehension	Working memory	Visual memory	Phonetic coding: synthesis	Meaningful memory	Rate of test taking
Quantitative reasoning	Listening ability	Quantitative reasoning	Verbal (printed) language comprehension	Learning abilities	Closure speed	Speech sound discrimination	Free-recall memory	Number facility
Piagetian reasoning	General (verbal) information		Cloze ability		Flexibility of closure	Resistance to auditory stimulus distortion	Associational memory	Semantic processing speed
Speed of reasoning	Information about culture		Spelling ability		Spatial scanning	Memory for sound patterns	Expressional memory	
	General science information		Writing ability		Serial perceptual integration	General sound discrimination	Ideational memory	
	Geography achievement		English usage knowledge		Length estimation	Temporal tracking	Naming facility	
	Communication ability		Reading speed		Perceptual illusions	Musical discrimination and judgement	Word fluency	
	Oral production and fluency				Perceptual alternations	Maintaining and judging rhythm	Figural fluency	
	Grammatical sensitivity				Visualization	Sound intensity / Duration discrimination	Figural flexibility	
	Foreign language proficiency				Imagery	Sound –frequency discrimination	Sensitivity to problems	
	Foreign language aptitude					Hearing and speech threshold factors	Originality / Creativity	
						Absolute pitch	Learning abilities	
						Sound localization		

Note. Boldface type indicates broad abilities. Regular typeface indicates narrow abilities that are placed under broad abilities. Adapted from: Flanagan, Ortiz, & Alfonso (2007). *Essentials of cross battery assessment* (2nd ed.). Hoboken, New Jersey: John Wiley & Sons, Inc.

Appendix B

Overview of Strengths and Areas of Difficulty

Relevant Rank Order
 Superior
 Above Average
 Average
 Below Average
 Well-Below Average
 Very Low

Reading: Well Below Average	
Detailed Strengths	Detailed Areas of Difficulty
Average <i>Cloze Ability</i> : Ability to supply words deleted from prose passages that must be read	Below average to well below average <i>Reading Decoding</i> : Ability to recognize & decode words and pseudowords in reading
Average <i>Verbal (printed) Language Comprehension</i> : General development, or the understanding of words, sentences, & paragraphs in native language, as measured by <i>reading</i> vocabulary & <i>reading</i> comprehension tests	Below average <i>Reading Speed</i> : Time required to silently read a passage or series of sentences as quickly as possible
Writing: Well Below Average	
Detailed Strengths	Detailed Areas of Difficulty
Average <i>Writing Ability</i> : Ability to write with clarity of thought, organization, & good sentence structure	Well-below average to very low <i>Spelling Ability</i>
Average <i>Writing Speed</i>	Average to below average <i>English Usage Knowledge</i> : Knowledge of writing in the English language with respect to capitalization, punctuation, usage, & spelling
Mathematics: Above Average	
Detailed Strengths	
Above average <i>Mathematical Knowledge</i> : Range of general knowledge about mathematics	
Average to above average <i>Mathematical Achievement</i> : Measured mathematics achievement	
Comprehension/Knowledge: Superior	
Detailed Strengths	
Superior <i>General Information</i> : Range of general knowledge	
Above average <i>Lexical Knowledge</i> : Extent of vocabulary that can be understood in terms of correct word meanings	
Above average <i>Language Development</i> : General development, or the understanding of words, sentences, and paragraphs (<i>not</i> requiring reading), in spoken native language skills	
Average <i>Listening Ability</i> : Ability to listen & comprehend oral communications	
Fluid Reasoning – Average	
Detailed Strengths	
Average <i>Induction</i> : Ability to discover the underlying characteristic (e.g. rule, concept, process, trend, class membership) that governs a problem or a set of materials	
Average <i>Sequential Reasoning</i> : Ability to start with stated rules, premises, or conditions, & to engage in one or more steps to reach a solution to a novel problem (i.e. deduction)	

Continued on next page

Appendix B *continued*

Visual-Spatial Thinking: Above Average	
Detailed Strengths	
Above average <i>Spatial Relations</i> : Ability to rapidly perceive and manipulate relatively simple visual patterns or to maintain orientation with respect to objects in space	
Average <i>Visual Memory</i> : Ability to form and store a mental representation or image of a visual stimulus & then recognize or recall it later	
Average <i>Spatial Scanning</i> : Ability to accurately and quickly survey a spatial field or pattern & identify a path through the visual field or pattern	
Short-Term Memory: Very Low	
Detailed Areas of Difficulty	
Well-below average <i>Working Memory</i> : Ability to temporarily store & perform a set of cognitive operations on information that requires divided attention & the management of the limited capacity of short-term memory	
Below average to well-below average <i>Memory Span</i> : Ability to attend to and immediately recall temporarily ordered elements in the correct order after a single presentation	
Long-Term Retrieval: Well Below Average	
Detailed Strengths	Detailed Areas of Difficulty
Average <i>Ideational Memory</i> : Ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object (quantity not quality is emphasized)	Well-below average <i>Associative Memory</i> : Ability to recall one part of a previously learned but unrelated pair of items when the other part is presented (i.e. paired-associative learning)
Average <i>Naming Facility</i> : Ability to rapidly produce names for concepts when presented with a pictorial or verbal cue	
Auditory Processing: Well-Below Average	
Detailed Strengths	Detailed Areas of Difficulty
Average <i>Speech Sound Discrimination</i> : Ability to detect differences in speech sounds under conditions of little distraction or distortion	Well-below average <i>Phonetic Coding (Analysis)</i> : Ability to segment larger units of speech sounds into smaller units of speech sounds
	Well-below average <i>Phonetic Coding (Synthesis)</i> : Ability to blend smaller units of speech together into larger units of speech
Processing Speed: Average	
Detailed Strengths	
Average <i>Perceptual Speed</i> : Ability to rapidly search for and compare known visual symbols or patterns presented side-by-side or separated in a visual field	
Average <i>Speed of Reasoning</i> : Speed of fluency in performing reasoning tasks (e.g. quickness in generating as many possible rules, solutions, etc., to a problem in a limited time)	

Appendix C

Participant Questionnaire**I am currently employed as a teacher**

- Yes
- No

I am currently a

- Full-time teacher
- Part-time teacher
- Substitute teacher
- Other, please specify: _____

I teach (check ALL that apply)

- Pre-school-level students
- Elementary-level students, if so, which grade(s)? _____
- Junior high-level students
- High school-level students
- College/University-level students
- Other, please specify: _____

Degree(s) I hold are within the following areas (check ALL that apply)

- Education
- Special education
- Educational Psychology
- School Psychology
- Psychology
- Other, please specify: _____

I teach

- Only/Mostly students without learning difficulties
- Only/Mostly students with learning difficulties
- About the same number of students both with and without learning difficulties

Appendix C continued

I have been a teacher for (please state the number of years/months; e.g. "6 years, 4 months")

I am

- Female
- Male

I am

- 26 years of age or under
- 27-39 years of age
- 40 years of age or over

Developing Interventions Using the Psychoeducational Report

For the following questions, you will need to refer to the psychoeducational report that was attached to the email you received. Try to read the report as if it described a student in your class. You will be asked to think of as many interventions as possible (i.e. teaching strategies and student accommodations) to help Raymond achieve various academic goals, using the information in the report.

For example, if a student has difficulty with remembering math facts, possible interventions for mathematical assignments involving the use of math facts might include:

- a) Provide the student with charts with addition and multiplication facts
- b) Allow the student to use a calculator
- c) Make math practically orientated by emphasizing real life skills, such as cooking and shopping
- d) Reduce homework assignments so that the student can concentrate on mastering basic math skills
- e) Use hands-on materials, such as marbles, to teach math facts

Although it is more beneficial to think of as many different interventions as possible, it is acceptable (and appropriate in many cases) to have some of the same interventions for different scenarios. If you cannot think of an intervention for a given situation, or if you feel that there is not enough information to create interventions, just type "N" in the space provided. To proceed to questions, click on "Next"

Appendix C continued

Please use the information provided in the report to develop teaching strategies and student accommodations for each of the following tasks. If there is not enough information provided in the report to support an intervention for a specific task, or if you cannot think of any interventions, type "N" in the space. **If you do not have a response for any of the following five situations, please scroll to the bottom and hit "Next" to finish the survey.

Think of as many interventions as possible to facilitate improved outcomes for Raymond when he is taking a test.

Think of as many interventions as possible to facilitate improved outcomes for Raymond when assigned a reading activity.

Think of as many interventions as possible to facilitate improved outcomes for Raymond when he is to prepare for, and give, a class presentation.

Think of as many interventions as possible to facilitate improved outcomes for Raymond when he is assigned a writing activity.

Think of as many interventions as possible to facilitate improved outcomes for Raymond when teaching a new topic in class.

*Appendix C continued***When developing interventions, how would you describe the following sections of the report?**

	Not at all helpful	Not very helpful	Slightly helpful	Moderately helpful	Helpful	Very helpful	Extremely helpful
Background Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Observations during Evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessment Results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overview of Strengths and Areas of Difficulty*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you describe your overall satisfaction with the way the information was presented in the psychoeducational report?

- Extremely dissatisfied
- Very dissatisfied
- Dissatisfied
- Satisfied
- Very satisfied
- Extremely satisfied

Your Thoughts?

Please provide any comments, complaints, and/or suggestions regarding psychoeducational reports (comments can pertain to the report used in this study and/or any psychoeducational reports you have read in the past). If you do not have any comments, complaints, and/or suggestions, type "None" in the space provided.

*Overview of Strengths and Areas of Difficulty section included only in experimental questionnaire

Appendix D



CONSENT FORM

Using CHC-based Strengths and Difficulties to Communicate Assessment Results to Teachers
Natasha Heather Buchanan

I am a graduate student in the Department of Education at Mount Saint Vincent University. I am conducting research under the supervision of Dr. Daniel Lagacé-Séguin, Department of Psychology. The purpose of the study is to help school psychologists improve communication of assessment results to teachers. Specifically, I am assessing ways to present the results in psychoeducational reports that will help teachers develop classroom interventions that flow logically from the results.

To achieve this research goal, I will require practicing school psychologists to verify that the report created for the study is valid. Participation will involve reading the report (attached) and identifying any inappropriate terms, or descriptions. If you agree that the report is acceptable, you will reply to this email by typing “Agree” in the subject heading. If you have suggestions to improve the report, you will clearly write them throughout the report (e.g. using “track changes” or red font), reply to this email by typing “Suggestions” in the subject heading, and attach the report with suggestions. Adjustments will continue to be made to the report until there is almost perfect agreement among participants.

The report can be printed off, or read from the computer screen. If you would prefer to have a hard copy of the report sent via postal mail, please reply to this email with your preferred mailing address.

There are no known risks involved in participation. Your participation in this study is voluntary and you may withdraw at any point. All data will remain confidential. Information that would make it possible to identify you will never be included in any sort of report. If you have questions, you may contact Natasha Buchanan or you may contact Dr. Daniel Lagacé-Séguin. This research has met the ethical standards of the University Research Ethics Board at Mount Saint Vincent University. If you have questions about how this study is being conducted and wish to speak to someone not involved in the study, you may contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research Office, at 457-6350 or via e-mail at research@msvu.ca.

By opening the attached report, you are agreeing that you understand the above information and that you consent to participate in this study.

Natasha Heather Buchanan, BSc (Hon), MASP student
Lead researcher

Daniel Lagacé-Séguin, PhD
Thesis supervisor

Appendix E



CONSENT FORM

Using CHC-based Strengths and Difficulties to Communicate Assessment Results to Teachers

Natasha Heather Buchanan

I am a graduate student in the Department of Education at Mount Saint Vincent University. I am conducting research under the supervision of Dr. Daniel Lagacé-Séguin, Department of Psychology. The purpose of the study is to help school psychologists improve communication of assessment results to teachers. Specifically, I am assessing ways to present the results in psychoeducational reports that will help teachers develop classroom interventions that flow logically from the results.

If you agree to participate in this study, you will be asked to fill out a brief demographic questionnaire. You will then read a psychoeducational report as if it described a student in your class, and answer five questions based on formulating interventions to help the student complete class assignments. Next, you will rate each report section for degree of helpfulness, and rate your overall satisfaction with the report. Participation will take approximately 25 minutes. For your participation, you will be entered into a draw to win one of two \$50 gift cards from Staples.

You will need to refer to the report (attached) while answering the questions, which means that you will have to leave it open in a separate window, or print it off. If you would prefer to have a hard copy of the report sent via postal mail before commencing the study, reply to this email with your preferred mailing address. If you would like to receive the results of the study, you will have the option of leaving your email address once the study has been completed.

There are no known risks involved in participation. Your participation in this study is voluntary and you may withdraw at any point without penalty. All data will remain confidential. A participant ID number will be used to identify your responses. Information that would make it possible to identify you will never be included in any sort of report. If you have questions, you may contact Natasha Buchanan, or you may contact Dr. Daniel Lagacé-Séguin. This research has met the ethical standards of the University Research Ethics Board at Mount Saint Vincent University. If you have questions about how this study is being conducted and wish to speak to someone not involved in the study, you may contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research Office, at 457-6350 or via e-mail at research@msvu.ca.

To begin the study, click on “Continue” below. By clicking on “Continue”, you are stating that you understand the above information and that you consent to participate in this study.

Natasha Heather Buchanan, BSc (Hon), MASP student
Lead researcher

Daniel Lagacé-Séguin, PhD
Thesis supervisor

Appendix F



CONSENT FORM

Using CHC-based Strengths and Difficulties to Communicate Assessment Results to Teachers
Natasha Heather Buchanan

I am a graduate student in the Department of Education at Mount Saint Vincent University. I am conducting research under the supervision of Dr. Daniel Lagacé-Séguin, Department of Psychology. The purpose of the study is to help school psychologists improve communication of assessment results to teachers. Specifically, I am assessing ways to present the results in psychoeducational reports that will help teachers develop classroom interventions that flow logically from the results.

In this study, teachers read a brief psychoeducational report as if it described a student in their class. They then formulated one to three interventions for a school assignment based on the assessment results. To ensure the interventions created are appropriate, and to prevent bias in scoring, I will require practicing school psychologists to verify the suitability of interventions, based on the assessment results. Participation will involve reading the report, and reading each school assignment scenario, along with the interventions developed for each scenario. Beside each intervention, you will click on either “Agree” or “Disagree,” depending on whether you think the intervention is suitable based on the report, which is attached to the email you received.

There are no known risks involved in participation. Your participation in this study is voluntary and you may withdraw at any point. All data will remain confidential. Information that would make it possible to identify you will never be included in any sort of report. If you have questions, you may contact Natasha Buchanan, or you may contact Dr. Daniel Lagacé-Séguin. This research has met the ethical standards of the University Research Ethics Board at Mount Saint Vincent University. If you have questions about how this study is being conducted and wish to speak to someone not involved in the study, you may contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research Office, at 457-6350 or via e-mail at research@msvu.ca.

By opening the attached report and interventions, you are agreeing that you understand the above information and that you consent to participate in this study.

Natasha Heather Buchanan, BSc (Hon), MASP student
Lead researcher

Daniel Lagacé-Séguin, PhD
Thesis supervisor

Appendix G

Teachers' comments in response to the prompt: *Please provide any comments, complaints, and/or suggestions regarding psychoeducational reports (comments can pertain to the report used in this study and/or any psychoeducational reports you have read in the past).*

Comments from experimental group (report with supplemental listing)

“School psychologists need to give very clear strategies to help students. Right now they say all of the difficulties and what may help improve performance, but without actual clear and implementable strategies to use”

“The chart used at the end of this report was useful, it helped me to consider the results from the report at a glance”

“The reports I receive are usually very dated because Primary age students change so quickly and dramatically. I get reports from the IWK that describe the child at age three or so and I have to derive something from that. Well, it can give me some of the basics, but by the time I get the child at five s/he has progressed and changed to the point that the report is less than helpful. Seeing the report is mostly just a reminder to me that I need to spend some additional time getting to know this child, need to call on the resource and support people in the building and at the Board level and find out how to help this child”

“The reports I have read, including the report used in this study, are well organized and thorough. They cover the technical details about the test as well as personal details about the child's emotional state. It is always important to go through the report with the psychologist and clear up any areas that are unclear, especially in regards to test results and statistics”

“This report was well written and detailed. I liked the brief listing of strengths and difficulties because it sketched out the results in a few words and made it easier to look up what I needed to know”

Comments from control group (report without supplemental listing)

“It is a challenging task to create interventions without specific explanations of what he can actually do (and cannot do)”

“Not all reports give the results of each test that the child has completed and without those results it makes the understanding of all cognitive areas difficult. Some reports I have read can be as few as 3 pages and those reports never give an adequate picture of the student either”

“It would be nice to have a short break down of his results, in point form maybe”

“I always included a separate recommendation section with very specific suggestions that I knew the school and/ home could follow up with. This report provides a lot of information which should be able to be used by a school. However, people without a psychology background would be confused by some of the information. Teachers typically just want to know the bottom line of what they can do”

“I think that when presenting the results it is visually better to have them in a chart format so that can you can clearly see the results and then refer to the specific sections for more written information. This report was thorough; however it needed more suggestions at the end of the report. Specific strategies to help Raymond with his learning profile would have been beneficial for classroom teacher and other specialists”