

# LEARNING DISABILITIES ASSOCIATION OF CANADA

## A LITERATURE FRAMEWORK TO GUIDE THE RESEARCH STUDY: PUTTING A CANADIAN FACE ON LEARNING DISABILITIES (PACFOLD)

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## 1.0 INTRODUCTION

The primary goal of the “Putting a Canadian Face on Learning Disabilities” (PACFOLD) project is to identify and verify the impacts that having learning disabilities (LD) can have on various aspects of an individual’s life. Meeting this goal meant that members of the project Research Committee had to undertake an initial examination of existing literature in the field of LD — literature that addressed, either singly or in combination, factors known to be associated with LD across the lifespan. Purposefully, we examined as broad a literature as possible in order to ensure that we would identify the majority of factors that would then be used to develop potential database indicators in Phase II of the PACFOLD project. Thus, studies that met the criteria for inclusion (see pages 3-4) are presented in a descriptive and consecutive writing style by section and subsection rather than in an integrated and critically evaluative manner. With this framework in place, the necessary points of reference for the investigation of relevant Statistics Canada databases are established.

### PARAMETERS OF THE LITERATURE FRAMEWORK

Several parameters were identified to guide the development of the literature framework, including

- definition and theoretical approach to LD,
- challenges within the literature,
- criteria for selection of studies, and
- organization of the literature framework.

### Definition and Theoretical Approach to LD

In 1998, the Learning Disabilities Association of Canada (LDAC) formed a National Think Tank to review the existing scientific literature on LD. The resulting paper, *Neurobiological basis of learning disabilities: An update* (Fiedorowicz *et al.*, 2001) (included as Appendix 1) provided the foundation for LDAC to revise its definition of LD for Canada. This new definition was adopted in January 2002. Excerpts from this definition are included throughout this paper. (The full definition is included as Appendix 2 and is available at <http://www.ldac-taac.ca/>.)

Since education policies and definitions in Canada are set by provincial/territorial ministries of education, educational definitions of LD vary across the country: students have *learning disabilities*, *learning differences*, *learning difficulties*, *learning disorders* or are considered to be *at risk*.<sup>1</sup> The term *learning disabilities*, as used in this framework, states that the origin of the disability is neurological. Although researchers in the field of

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<sup>1</sup> These terms will occasionally appear in this document if they were the terms used in the cited study.

brain functioning are now able to demonstrate processing differences between those with and without LD, these results have not had an impact on assessment. Thus, studies included in this framework were considered when they included samples of persons with LD who met clearly defined and broadly recognized criteria. However, it remains that most children and youth identified under the various terms by ministries of education would meet the criteria for LD and likely would be included among the LD respondents in the surveys under study.

As its theoretical framework, this examination of the literature looks at diverse patterns of LD rather than at a singular learning disability. As previously noted in the LDAC definition, LD is multi-dimensional in nature and results in a “number of disorders” that can be manifested in many different ways. Any single major indicator, such as reading difficulties, might posit the presence of a learning disability. Two or more indicators would provide stronger evidence of LD within a population. The subtyping literature on LD provides support for this approach by describing varying manifestations. Examples of this approach are non-verbal LD<sup>2</sup> (Harnadek, 1994), dyslexia (Roberts & Mather, 1997) and patterns of achievement (Fletcher *et al.*, 2003).

Recent research has examined the neurological implications of two specific learning disabilities (i.e., non-verbal LD and language LD). Although localized to different areas of the brain, each disorder results in an overflow neurological impact beyond the localized impact, suggesting the need for a systems approach to better understand the effects of LD (Zera, 2001).

As explained in LDAC’s definition:

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....

Neurological research indicates that LD are usually characterized by patterns of neurological functioning that differentiate those with LD from their normally achieving peers. The validity of using several indicators to study the impact on Canadians of having LD emerges from the neurological and subtyping literature.

## **Challenges within the Literature**

A particular challenge for this framework is the fact that most Canadian and American studies are anchored in definitions of LD that have historically been tied to education. This educational focus means that a significant proportion of the literature is limited to school-aged children and uses “school-related” criteria (e.g., significant underachievement) to determine inclusion of participants. As noted previously, and as

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<sup>2</sup> Non-verbal LD are characterized by deficits in visual-perceptual-organization, psychomotor coordination and complex tactile-perceptual skills.

supported by more recent literature, LD are neurological in origin and, therefore, affect all areas of an individual's life — from childhood to old age.

Furthermore, this framework retains the term “neurological” in its definition because the impact of LD becomes even more apparent when an individual reaches adulthood. Whereas development in childhood has been described as rapid and temporally compact (P. Gerber, 1994), adult development is much longer and more diverse. Thus, the impact of LD can be more pervasive in adults, and needs to be examined within an adult development orientation (Polloway, 1984) and in consideration of the major life demands of adulthood (i.e., employment/education, home and family, leisure pursuits, community involvement, and mental and physical health) (Patton & Polloway, 1992). As aptly stated by one adult with LD, “The problem with a (learning) disability is it's not life-threatening, it's life-affecting. And it affects every facet of your life” (Shesell & Reiff, 1999).

A second challenge relates to the limited adult literature on LD. The literature that does exist focuses primarily on educational issues among postsecondary students with LD — a population that represents a relatively minor and perhaps atypical subgroup of LD adults.

A definition of LD structures how individuals are assessed and consequently the instructional interventions provided. In recent years there has been a movement towards using Response to Intervention (RTI) as a means of identifying students with LD, rather than the discrepancy between IQ and achievement, as is used in many provinces (National Reading Panel, 1999). This movement remains controversial, and, although studies on this topic are appearing in the current literature, the surveys being analyzed do not take any of these developments into consideration.

### **Criteria for Selection of Studies**

This framework is based on articles published between 1990 and 2005. Full articles were searched from ProQuest, Science Direct, MedicalConsult, ERIC and PsychINFO using the following descriptors: LD, learning disability, and each of the subtopics of this paper (e.g., education, personal characteristics, social characteristics) and sub-subtopics (e.g., oral language, reading, writing, arithmetic or mathematics, grade retention, absences, level of school attainment). This search resulted in close to 150 articles. In addition, other articles were identified from the bibliographies of some of the cited articles.

The choice of reference articles for inclusion in this paper was based on clearly structured criteria. References represent original research in a peer-reviewed journal (e.g., *Journal of Learning Disabilities*, *Learning Disabilities Quarterly*, *Learning Disabilities: Research and Practice*, *Annals of Dyslexia*, *Dyslexia*). Meta-analyses were included when available. In addition, articles that presented reviews of literature relevant to a particular topic were eligible for inclusion only when there were few or no research-based sources of information readily available (e.g., substance use). Book chapters were incorporated when they were written by well-respected researchers in the field and when

the chapters addressed key issues or topics not covered elsewhere. This was particularly the case for longitudinal studies and for information relevant to adults. Efforts were also made to highlight studies that were based on Canadian samples or that dealt with Canadian issues. Ultimately, the literature framework included 165 references.

Both quantitative and qualitative studies were represented. Quantitative studies were judged appropriate when their design reflected current standards for quantitative research (e.g., inclusion of control groups, adequacy of sample size) and when the definition of the group with LD reflected the definition referred to earlier as established by LDAC (i.e., children, youth or adults defined as having average abilities). Qualitative studies were judged appropriate when they responded to the following criteria (Anfara Jr. *et al.*, 2002):

- credibility (e.g., prolonged engagement in the field, triangulation of data analysis, time sampling);
- transferability (e.g., provide thick description, purposeful sampling);
- dependability (e.g., provide an audit trail, triangulation, code-recode strategy); and
- confirmability (e.g., practice reflexivity).

Such criteria have evolved out of the initial qualitative work done in the 1980s (Guba & Lincoln, 1989) and more recent work on specific forms of qualitative inquiry (Denzin & Lincoln, 1998) as well as case study research (Yin, 1994).

## Organization of the Literature Framework

The literature framework is divided into six main sections, as follows:

- education,
- personal/social,
- employment,
- parent/family,
- health, and
- finance.

An additional section — success and resilience — explores the factors that are associated with the successful adaptation across the lifespan for persons with LD.

Each section/subsection describes studies representative of recent research literature. Discussions of studies within sections and subsections progress by age groupings from youngest to oldest.

Since most definitions of LD to date have been education-based, research on the impact of LD at an early age focuses on age five as a starting point. This focus has led to the practice of not identifying those at risk for LD until they enter the school system, generally around the age of five. Therefore, many researchers use the education divisions

to define the parameters of their studies, and, as such, we have adopted this as the starting point for our research. Forty-four was identified as the upper end of our research because LD was first identified in the early 1960s. Individuals who were identified at that time would now be in this age bracket.

Within this broad age group of 5 to 44 years, we have created four age groups:

- Children (5 to 14) – Typically databases deal with children aged 5 through 14 years differently from the adult population aged 15 and older.
- Youth or adolescents (15 to 21) – This age group has some characteristics similar to children, but the national databases include them with the young adult population — those who are transitioning to employment or postsecondary studies. For this reason, we identified them separately.
- Young adults (22 to 29) – This is the age group where persons may be in their first job or may be looking for work following their postsecondary studies. They are moving towards independence in terms of supporting themselves, moving out of the family home and establishing stable relationships.
- Adults (30 to 44) – Adults in this age category are more independent and stable in their employment, living arrangements and relationships. In addition, health problems begin to develop at this age.

Findings relevant to gender differences are included separately at the end of each section. In addition, each of the sections concludes with a table of potential indicators for LD that is organized according to the age categories detailed above.



## 2.0 EDUCATION

Historically, LD have been identified as related to academic learning, and this tradition is reflected in the surveys used for the PACFOLD project. However, it is important to note that the academic disabilities discussed in this section are a consequence of specific deficits in the underlying information processing system in the brain. Among such deficits are those related to memory (L. Siegel, 2003; Swanson & Sáez, 2003), auditory processing (Bell *et al.*, 2003) and executive function (Ylvisaker *et al.*, 2000).

Since it was not possible to clearly extract information related to these deficits from the surveys under study, this section was structured by a further excerpt from LDAC's definition, which focuses on specific academic domains:

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).

The section includes an examination of the following issues: difficulties in oral language, reading, writing and mathematics; grade retention; absences from school; graduation rates and level of education attained; time in educational program; placement (school or class); areas of study (postsecondary); and gender. Although the topic of motivation is frequently considered only as it relates to academic learning, this topic will be addressed separately to recognize its importance across the life span (see pages 22 and 23). The section concludes with a table that details the significant educational indicators of LD.

### DIFFICULTIES IN ORAL LANGUAGE, READING, WRITING AND MATHEMATICS

Few individuals exhibit LD in only one domain. More prevalent are clusters of disabilities that reflect underlying differences in neurological functioning. In fact, some children and adolescents with LD have difficulty in all four academic domains: oral language, reading, writing and arithmetic or mathematics (Gross-Tsur *et al.*, 1996). The interaction and links among different domains of academic functioning are strongly supported in the literature. This will be made evident through our discussion of selected studies that may have a primary focus on a specific domain, but that also make links to other domains of academic functioning.

It is important to note that the surveys do not provide data on the type of instruction received by the individual with LD. It is well known that the type and effectiveness of instructional interventions has a profound influence on students' abilities to learn (Hewitt & Scardamalia, 1998), that students' construction of their own knowledge within collaborative environments is a powerful contributor to learning in all domains (Reid,

1991), and that cognitive strategy instruction is influential in helping those with LD to become better readers and writers (Bernice Y. L. Wong *et al.*, 2003). Because types of instructional interventions cannot be determined from the surveys, this aspect is not considered further in this framework.

The selected studies will be described in the following order: (a) oral language, (b) reading achievement, (c) writing and text production, (d) arithmetic and mathematics, and (e) persistence of academic deficits over the lifespan.

## Oral Language

Oral language is seen as developing in the home during interactions with significant others (Flax *et al.*, 2003). Problems in this area consist of difficulties in understanding or processing language (e.g., following directions) and difficulties in producing language (e.g., using appropriate vocabulary, hesitancy, using non-specific words, inaccurate syntax or grammar). Whereas language processing difficulties are closely tied to reading achievement, language production deficits contribute to difficulties in summarizing and answering oral comprehension questions. Additionally, language production problems are significantly related to achievement in writing. The impact of oral language on school-age children and adolescents will be further addressed in the following two sections.

## Reading Achievement

Problems in the language processing systems in the brain, as exhibited by children and youth/adolescents, underlie specific types of reading difficulties. A significant marker for reading disabilities/dyslexia<sup>3</sup> is the inability to process phonemes or the sounds within words (R. K. Wagner & Torgeson, 1987). As indicated in a recent American report on reading development (National Reading Panel, 1999), the impact of weak phonemic awareness on decoding words is significant. Reading achievement is also affected by other difficulties in the brain's language processing regions, including weak vocabulary retrieval (Wolf, 1991), poor use of syntactic structures (Schoenbrodt *et al.*, 1997) and difficulty understanding complex sentence structures (Schoenbrodt *et al.*, 1997).

Reading research has historically recognized that those with reading disabilities may show a profile of poor decoding, poor comprehension or a combination of the two profiles (National Reading Panel, 1999). As noted above, most reading-disabled children have difficulties from the earliest stages of reading, but there are those who are not identified until later. A recent longitudinal study in one school district that followed students (N=1008) from pre-kindergarten to grades 7-8 saw the emergence of a group of reading disabled children at grades 4-5 (Badian, 1999). Although these children did not have difficulties with phonemic awareness or sound/symbol correspondence, they had

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<sup>3</sup> The term "dyslexia" will occasionally appear in this document if it is the term used in the cited study. Although there is no singularly agreed upon definition of dyslexia, generally it refers to significant reading disabilities in persons of average ability that have been present since the early years of schooling.

significant deficits in reading comprehension. A second study compared later- (grade 4) versus earlier-identified reading-disabled children. It found that the later-identified group was made up of three types, all of which were represented: weak word level skills plus adequate comprehension; adequate word level skills plus poor comprehension; and poor in both. They concluded that some deficiencies were not as evident at younger ages (Leach *et al.*, 2003).

## **Writing and Text Production**

Researchers addressing the neurological basis of reading and writing report that both dysgraphia (e.g., handwriting, spelling) and dyslexia are associated with a functional weakness in the same region of the brain's left hemisphere (V. W. Berninger *et al.*, 2002). Language difficulties in both phonemic awareness and in speech production (e.g., word retrieval) have been identified as sources for difficulties in writing (i.e., spelling, handwriting and text production) (Singer & Bashir, 1999). The ability to produce quality text or to write requires accurate spelling, varied and appropriate vocabulary use, correct syntactic structures, and appropriately applied knowledge of text structures or genres. A study of 12 fourth- and sixth-grade students with LD found that they had more difficulties in the mechanics of writing (e.g., transcription skills) and in sustaining production than a control group of students without LD (Steve Graham, 1990).

However, text production requires more than good spelling and automaticity in handwriting. Cohesive and well-organized texts are produced when students understand how to plan, organize and revise. A study of 39 fourth- to eighth-grade students with LD and 29 normally achieving students at the same grade levels found that those with LD had deficits in their knowledge of what good writers do when they write and had few strategies for planning and organizing or for revising and editing (S. Graham *et al.*, 1993). These results are supported by a Canadian intervention study of adolescents with LD that showed that these adolescents were unlikely to use appropriate metacognitive strategies (e.g., outlining or webbing for planning) and were not self-reflective during the writing process (e.g., self-questioning) (B. Y. L. Wong, 1997).

## **Arithmetic and Mathematics**

Despite adequate development in early reading, some children with LD experience significant difficulties in their arithmetic/mathematics development. This group has been identified as having nonverbal LD, characterized by particular difficulties in mathematical tasks involving visual-spatial skills (Rourke & Conway, 1997). However, underlying deficits in reading may also interfere with arithmetic or mathematical problem solving. Comparing 18 fourth graders with a mathematical disability and 22 matched students with both mathematical and reading difficulties, one study found that the problem-solving performance of students decreased as the language structure of the presented problems became more complex (e.g., number of words, sentence complexity and length) and as the number of operations needed to arrive at an answer increased

(Fuchs & Fuchs, 2002). Even when only the operations of arithmetic were considered (i.e., adding, subtracting, multiplying and dividing), students with LD performed at a lower level and progressed less quickly than their normally achieving peers (Cawley *et al.*, 1998).

The pervasiveness of the underlying components contributing to varied profiles of LD (i.e., language learning and nonverbal disability) was evident in a study of 35 seven to nineteen year olds. Results indicate that working memory problems were common to both profiles and were evident to a higher degree in the older subjects (Zera, 2001). In addition, poor childhood oral language has been associated with poor secondary level outcomes in mathematics (Vogel *et al.*, 1993).

### **Persistence of Academic Deficits over the Lifespan**

Difficulties in language processing persist throughout a person's lifetime. This is underlined by the LDAC definition of LD that is used in this framework:

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....

An example of the lifelong impact of LD comes from current research that links the applicability of a classification system used on children to use on adults. A Canadian study of 331 Toronto adults (aged 16 to 72) with learning difficulties (Shafir & Siegel, 1994) found that a subtyping classification system (i.e., reading disabilities, arithmetic disabilities, and reading and arithmetic disabilities) used on children would be equally effective for an older population sample. Adolescents and adults with reading disabilities and reading and arithmetic disabilities still had phonological processing problems, while the reading and arithmetic disabilities group at both the non-postsecondary and postsecondary levels continued to show both phonological and visual deficits in reading. These findings were independent of educational level attained and indicate that some of the manifestations of LD remain stable over an individual's lifespan.

Other studies support these findings. Researchers have recently studied the lifelong influence of dyslexia. A 2003 study of 60 young adults (aged 17 to 23) who had been diagnosed with dyslexia as children showed that they continued to have difficulties in phonological processing, naming speed, general knowledge and vocabulary when compared with chronologically matched young adults with no history of dyslexia (Ransby & Swanson, 2003). These results may be better understood from a study of 28 postsecondary students with longstanding reading disabilities who were found to have persisting deficits in all areas of phonological processing that continued to compromise reading performance, particularly reading fluency (Wilson & Lesaux, 2001).

However, another study indicates that some manifestations shift as the individual matures. An example comes from Berninger's longitudinal study of seven boys diagnosed with LD (2000). Initially these boys had difficulty with learning sound/symbol

correspondence — an outcome of poor phonemic awareness. As they grew older, they exhibited difficulties with reading words accurately and with decoding multi-syllabic words. Finally, 10 years later, they exhibited difficulties with reading fluency and with written expression skills, including handwriting automaticity, spelling and compositional fluency (V. Berninger, 2000). Whether the manifestations of LD remain stable or shift, they continue to impact the individual over his or her lifetime.

Frequently, reading problems continue to have a direct effect throughout an individual's life. A study of 133 adults with LD across a broad age span compared highly successful and moderately successful groups to determine which of 13 problem areas (e.g., reading, listening, attention) persisted over time and which manifested change over time. Over 40% of both groups reported that their problems had worsened in 5 of the 13 areas, particularly reading, writing and distractibility. Contrary to the common claim that some areas improve in adulthood, only 1 of the 13 areas (visual perception) was reported to have improved by more than 10% of the entire group (P. Gerber *et al.*, 1990).

When students who graduated from postsecondary education were surveyed to assess self-reported problems at work, 44% reported processing difficulties (including time to complete tasks, organization, perception and reversals) and 27% reported language difficulties (reading comprehension, written language and spelling), while only 4% reported social or emotional difficulties in the workplace. Non-graduates with LD also appear to have these same difficulties, although they were less likely to acknowledge their effects (P. Gerber *et al.*, 1990). Difficulties in the underlying components of oral language, reading, writing and arithmetic continue to influence levels of performance throughout students' academic careers and into adulthood.

## **GRADE RETENTION**

Investigations conducted in the United States estimate that 30% to 50% of students are held back once before they reach the ninth grade, and that the most frequent academic difficulty cited is reading (National Association of School Psychologists, 2003), while other difficulties include reading and mathematics (McCoy & Reynolds, 1999). In addition, grade retention has been associated with a higher dropout rate (Jimerson, 1999).

In a meta-analysis of 20 studies on the impact of grade retention (Jimerson, 2001), only four showed positive results. However, several authors pointed out that positive outcomes were dependent on providing remedial support in the year retained, not on just repeating the previously unsuccessful instructional interventions. When limited to studies following children through grade 7, there appeared to be no difference between the students retained and the matched groups for either academic achievement or for socio-emotional adjustment. Longer-term studies have indicated a less optimistic outcome for students retained in elementary school. In a 21-year longitudinal study of 190 children, grade retention in kindergarten or grades 1, 2 or 3 resulted in a higher dropout rate by age 19. Those retained were less likely to take or pass the high school equivalency exams (GED) by age 20 and were less likely to enrol in postsecondary programs (Jimerson 1999).

However, social promotion — or the moving of students from one grade level to the next without having them passed core subjects — is not identified as being any more successful (Nagaoka & Roderick, 2004). Thus, neither grade retention nor social promotion is an appropriate response to the poor academic achievement of students with LD.

## **ABSENCES FROM SCHOOL**

A comparison of specific results for the first (1994) and second (2002) National Longitudinal Transition Study (NLTS1 and NLTS2) in the United States on individuals with LD report that absences of four or more days have increased from 11% to 22.3%, and that the mean number of days absent has risen significantly. In addition, the number of suspensions rose from 10.1% to 16.8% (Wagner, Newman *et al.*, 2004). The reported increases in school suspensions may be of concern given that an earlier study found school suspensions to be associated with lower graduation rates among high school students with LD (Kortering *et al.*, 1992).

## **GRADUATION RATES AND LEVEL OF EDUCATION ATTAINED**

High school graduation and some postsecondary studies are seen as contributing to the later success of adults with LD. Studies prior to 1990 consistently found that persons with LD were less likely to graduate from high school, were less likely to go on to postsecondary education and would take longer to finish programs in which they enrolled. NLTS1 reported that almost one-third of adolescents with LD did not receive their high school diplomas, a failure rate substantially higher than for the general population. In addition, these adolescents were less likely to enroll in subsequent vocational or academic programs (Blackorby & Wagner, 1997).

In a study of grade 12 students with LD, it was found that the percentage of adolescents with LD who did not aspire to postsecondary education was almost three times that of adolescents without LD. Of those who did aspire to postsecondary education, twice as many adolescents with LD aspired only to vocational training, and they were three times less likely to aspire to college-level education (Rojewski, 1999).

In contrast, students with LD who took vocational courses in high school were less likely to drop out. When these students with LD were followed two years after high school, only 13.9% were attending or had attended some type of postsecondary education system in comparison to 53% of students without LD. However, three to five years after high school, 30.5% of students with LD were attending or had attended a postsecondary school (Blackorby & Wagner, 1996).

Graduation rates for those students/young adults with LD who do attend postsecondary (university) training do not appear to be significantly different from their peers without LD. One study, which compared LD and non-LD groups, found 37% and 39% graduation rates, respectively (Vogel & Adelman, 1990). The same researchers found no significant

differences between the educational attainment of the LD and non-LD groups. Sixty per cent of the LD group, as compared to 56% of the non-LD group, had completed a Bachelor's degree, and 12%, as compared to 20%, respectively, had completed their Master's or Doctorate degree. In addition, there was little difference found between the percentage of those two groups who did not complete their degree (24% for the LD group, as compared to 17% for the non-LD group) (Vogel & Adelman, 2003).

Furthermore, postsecondary graduation rates appear to be affected by prior postsecondary experiences. In a comparison of graduates and non-graduates, 64% of the graduate group had prior college experience in another postsecondary placement, as compared to only 4% of the non-graduate group (Vogel *et al.*, 1993). Eighty-three per cent of graduating students with LD entered the institution from which they graduated after previously completing at least one year of their degree elsewhere, whereas all of the non-graduates entered as freshmen. There was also a higher failure rate among students in the LD group who entered university directly from high school (Vogel & Adelman, 1992). This suggests that a higher success rate for students with LD may be related to prior college experience before entering a particular postsecondary institution.

## **TIME IN EDUCATIONAL PROGRAM**

Research indicates that youth and young adults with LD take longer to complete their studies. A study of secondary students in Quebec with (n=112) and without LD (n=525) indicates that those with LD were older than others at the same grade levels (Deslandes *et al.*, 1999). Researchers report that postsecondary students with LD took on average 4.6 years to complete their degree, in comparison to 4.1 years for individuals in the control group (Witte *et al.*, 1998).

## **PLACEMENT (SCHOOL OR CLASS)**

Various types of service delivery are available to students with LD. From most restrictive to least restrictive environments, these include

- a separate school for students with LD, a special education school or a self-contained classroom within a regular school;
- a resource classroom where children are integrated into a regular classroom for non-academic subjects such as art, music and physical education;
- a resource pullout program where students are pulled out of inclusive classrooms according to a specified weekly schedule for help in areas of weakness (e.g., reading); and
- total inclusion, where the students receive all academic support in the regular classroom (e.g., team teaching and/or resource help in the classroom).

In the 1970s, the United States' Congress first recognized students with LD and funded special services either in resource rooms or in self-contained classrooms. This situation

continued until the mid-1980s when the movement to “mainstream” began. This movement was based on the perception that social inclusion would avoid the stigmatizing effect of labelling students. Some of these students were mainstreamed for non-academic subjects; others spent most of their day in the regular classroom, but went to a resource room for reading or mathematics. In the early 1990s, inclusion became the norm (i.e., students received remediation within the regular class). This was seen as providing both academic and social inclusiveness (Martin, 1993).

Although educational placement environments in Canada have essentially mirrored those available in the United States, each province and territory has different legislation, policies and special education services. In 1992, three provinces (Prince Edward Island, Alberta and British Columbia) were identified as not having mandatory special education legislation (Wiener & Siegel, 1992). The same study found that services and programs varied across provincial and territorial jurisdictions, within Aboriginal communities, and across Canada’s two official cultures. This remains the case today.

Few Canadian studies have evaluated class placement or the provision of services to students with LD. However, a recent study based on Statistics Canada data reports that 59% of special education students were taught in regular classrooms and given resource support outside the classroom (i.e., the mainstream model discussed previously) and 16% of special education students received all instructional support in the regular classroom (i.e., the inclusion model) (Bohatyretz & Lipps, 2000).

Since the early 1990s, changes in service delivery have meant that Canadian students with LD have been placed overwhelmingly in inclusive classrooms with varied levels of support, although some provinces and territories do not recognize the existence of the disorder and fail to provide any support. Access to school services for children and youth with LD is initially dependent on the policies of the province in which they live as well as the financial resources allocated by the ministries of education. In Canada, not being diagnosed with LD may be more a function of policy than of the presence or absence of LD.

In terms of placement, controversy exists as to the effectiveness of the different options. A recent Canadian study investigated the impact of four classroom placement options (in-class support, resource room, inclusion and self-contained class) on the social-emotional functioning of children with LD (Wiener, 2004). These authors studied 117 children with LD in grades 4 to 8 in Toronto, and they found that social acceptance was higher for those in regular classrooms (i.e., help provided by the classroom teacher) as compared with those in resource room placements (i.e., help provided outside the classroom), while there was no difference between the social acceptance ratings of severely disabled students in inclusive (i.e., outside support provided in the classroom) as compared with self-contained classrooms (i.e., all education provided outside the regular classroom). Lower quality of friendships (e.g., sitting together at lunch, picking each other as partners) and more problem behaviours were experienced in self-contained classrooms than in the inclusive classrooms.



A study of preschool children with (n=120) and without (n=69) disabilities in regular childcare and in specialized settings concluded that placement in specialized classrooms for those with disabilities produced fewer friendships (Buysse *et al.*, 2003). In terms of what students appear to prefer, a small group (i.e., 16 children with LD who had experienced pullout resource support and total inclusion and 16 children without LD) of fourth-, fifth- and sixth-grade students did not appear to have any particular preference. Inclusion was seen as being better for making friends, whereas pullout was seen as better for learning (Klinger *et al.*, 1998). A recent study that examined the perceptions of school life of secondary students with LD (N=222, aged 13 to 21) showed that those in self-contained classrooms experienced stronger feelings of “normlessness” (defined as the inability to understand or follow social rules), powerlessness and estrangement than their peers. They were also less likely to engage in school life or in learning (Brown *et al.*, 2004).

In contrast, there appears to be no clear indications of the effectiveness of class placement on academic achievement. A study investigated the progress of students with mild and severe LD (n=71) in inclusive classrooms versus students with mild or severe LD (n=73) receiving support in resource rooms. The inclusive class approach resulted in higher achievement in reading and math than did the resource room approach. However, those with severe LD progressed equally well in both models of service delivery (Waldron & McLesky, 1998). Results of effectiveness depend on what is being measured (social inclusion or academic progress) and the severity of the LD (i.e., mild, moderate or severe). While inclusive classrooms appear to promote social acceptance and friendships, regular classroom placements appear inconclusive in promoting the academic achievement of students with LD. One well-respected researcher commented that regular education classrooms are “not supportive places in which to implement what we know to be effective teaching strategies for students with disabilities” (Zigmond, 2003).

## **AREAS OF STUDY (POSTSECONDARY)**

Of postsecondary students or young adults with LD, a study found that 30% chose to major in education, 25% in business and management, 17% in social sciences, 11% in the performing arts, 8% in humanities, and 3% in each of chemistry, computer programming and English (Adelman & Vogel, 1990). This reflects a wide range of chosen majors, but those with LD do tend to steer away from domains that require extensive writing and reading, such as English or languages in general. One study reported the top three degree choices for students with LD to be psychology (13%), history (11%) and business (10%). Although still shying away from typically literary-based majors, the choice of majors by students with LD was just as diverse as for other students within the university (Witte *et al.*, 1998).

As noted above, very few students with LD chose to study in the sciences or mathematics. A survey of both parents and teachers of math and sciences reported that counselors were likely to steer students with LD away from sciences and math. Parents felt that math/science teachers did not make a sufficient effort to accommodate students with LD, while teachers reported that students with LD lacked the appropriate role

models in science and engineering (Alston *et al.*, 2002). Interestingly, data from the NLTS1 and NLTS2 showed an increase in the number of students with LD who were taking science courses (64.1% to 84.8%) and mathematics courses (80.6% to 92.7%) (Wagner, Newman *et al.*, 2004).

## **GENDER AND EDUCATION**

Gender's influence on the prevalence of LD (i.e., higher for boys than for girls) is an issue that has preoccupied researchers for a number of years. Even recently, elementary school age male students with LD were seen as outnumbering females with LD in a ratio of 3.2:1 for those who exhibited differences between listening and reading comprehension (Badian, 1999). Current literature on this topic has found the incidence rate for reading difficulties to be equivalent for males and females (Share & Silva, 2003). Yet a recent review indicates that those studies previously identifying little or no disparity between prevalence rates for males and females were flawed methodologically. The authors call for further study of this issue with carefully constructed design (Liederman *et al.*, 2005).

A Quebec study on the dropout rate of 403 males and females (67% aged 17 to 19, 22% older than 19 and 11% aged 16 or less) found that the incidence rate of dropout was the same for both genders, but that the reasons given for dropping out differed (Théorêt & Hriméch, 1999). Males tended to give the following reasons: boredom with school, suspension or expulsion from school, desire to learn a trade, and interpersonal problems with members of other ethnic or cultural groups. Like males, females gave boredom as one reason for dropping out, but they also cited other reasons, including the birth of a baby and family and personal problems.

Gender differences in graduation rates of postsecondary students have been reported as follows: a rate of 32% versus 29% for graduates versus non-graduates for males with LD and 35% versus 17% for females (Vogel *et al.*, 1993). Females with LD tend to graduate from postsecondary institutions at higher rates than males.

## **INDICATORS**

Although a comprehensive psycho-educational assessment is required for formal recognition of LD in any school or postsecondary setting, the following clusters of indicators (detailed in Table 1 on the following page) often reflect the underlying presence of LD.

**Table 1: Educational indicators associated with LD**

<b>Age Group</b>	<b>Indicators</b>
<b>1.1 All age groups</b>	<p>1.1.1 Received/receiving speech or language services: Oral language skills: difficulties with phonemic awareness, word retrieval, use of correct syntax, lack of vocabulary, pragmatics of language use</p> <p>1.1.2 Received/receiving reading resource help in/out of school: Difficulty in decoding and/or comprehension, difficulty in fluency</p> <p>1.1.3 Received/receiving resource help in/out of school: Difficulty in producing cohesive, well-organized text with adequate attention to spelling, punctuation, etc., difficulty in automaticity of underlying skills (e.g., handwriting, spelling)</p> <p>1.1.4 Received/receiving arithmetic/mathematics resource help in/out of school: Weak rote memory for facts, poor problem-solving skills</p> <p>1.1.5 Self-reported difficulties with reading, writing, numeracy</p> <p>1.1.6 Grade retention</p> <p>1.1.7 Long-term absences (&gt; 4 days) from school</p> <p>1.1.8 School placement in a special school or self-contained class, resource room or resource room support</p> <p>1.1.9 Tutoring or outside school support</p> <p>1.1.10 Frequent school changes</p>
<b>1.3 Youth and Adults</b>	<p>1.3.1 Secondary program in general (e.g., emphasis on applied learning), technical or vocational studies</p> <p>1.3.2 Not graduating (from high school or a postsecondary program)</p> <p>1.3.3 Taking longer to finish secondary or postsecondary studies, (e.g., enter workforce at a later age than peers)</p> <p>1.3.4 Field of study in business management, social sciences or the performing arts</p>

### 3.0 PERSONAL/SOCIAL CHARACTERISTICS

The definition of LD recognizes that personal and social dimensions mediate the influence of LD, but also that difficulties in this area constitute one of the dimensions of LD:

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

For children with LD, the negative effects of experiencing failure may be manifested in low self-esteem and reduced academic effort. Some children and adolescents with LD exhibit difficulties in age-appropriate social interactions. Postsecondary students with LD have been observed to exhibit poor self-concepts, have problems with interpersonal skills, and have deficits in processing and study skills (Ransby & Swanson, 2003). In addition, current research is beginning to demonstrate that negative early developmental experiences can continue to impact significantly on adults.

This section includes information on the following issues: relationships and social functioning; self-concept, self-esteem and self-determination; motivation; perseverance; skills of independent living; involvement in community and leisure activities; community adjustment problems; and gender. The section concludes with a table that outlines the personal and social indicators of LD.

#### RELATIONSHIPS AND SOCIAL FUNCTIONING

Relationships cover a broad area of social functioning. For children, this refers to relationships with family members (e.g., siblings, parents) and peers. During adolescence, relationships with peers and with personal significant others become significant contributors to positive or negative self-esteem. During adulthood, marriage and parenting have a significant influence on an individual's feeling of well-being.

The available literature on children shows that many children with LD have concomitant problems in social relations. In the late 1980s, definitions of LD added inadequate or inappropriate social skills to the list of characteristics associated with LD. Problems in the social domain expressed or exhibited by children and adolescents or youth have now been consistently documented. Mother-child interactions have been identified as having a significant influence on the cognitive development of "at-risk" children. One hundred and forty-five children entering school at the kindergarten age (70 identified as at-risk for learning disorders and 75 typically developing children) and their mothers took part in a study that investigated the effects of gender and temperament on patterns of attachment, mothers' coherence and family cohesion. Temperament was identified as a significant contributor to attachment patterns for at-risk children. More difficult temperament was related to lower family cohesion. Thus, the mother-child interaction provided either a risk or protective factor for those children identified as "at risk" for developing learning disorders (Al-Yagon, 2003).

A recent meta-analysis of the social functioning of children with LD in inclusive classrooms concluded that these children were at greater risk of social difficulties than their higher-achieving peers without LD and that they were less accurate in assessing their own social acceptance by others, often rating it as higher than it was (Nowicki, 2003). A small Canadian qualitative study of the perceptions of 16 parents and their children with LD regarding their children's friendships resulted in the parents making a lower assessment and the children a higher one of the number and quality of friendships (Wiener & Sunohara, 1998). An investigation of conversational and social problem-solving skills — traits that have been previously identified as underlying friendships — found fourth- and fifth-grade students with LD to be less competent in solving interpersonal problems (Kravetz *et al.*, 1999). A second Canadian study concluded that children with LD had “fewer corroborated/reciprocal friends, lower quality of friendship, lower social acceptance, lower academic self-concept, (and) poorer social skills than their normally achieving (non-LD) peers” (Wiener, 2004).

Those with language-based LD often have significant social problems. Their divergence from the norms in understanding social rules and situations results from deficits in pragmatics (i.e., the ability to appropriately interact with others) or information processing (i.e., the ability to understand or retain another's message). A study of 50 children with language-based LD (aged 8 to 12) and 50 controls found that the students with language-based LD had problems in using appropriate social discourse and social skills. As a consequence, they exhibited more problematic behaviours (Vallance & Wintre, 1997).

Negative or less than successful social interactions with peers has a negative impact on children with LD. A small experimental study of 21 fourth- and fifth-grade boys and girls with LD found them to be hypersensitive to negative interactions. Hypersensitivity had a heightened negative impact on self-appraisals of competence in social situations (Margalit, 2003). Such children also tended to internalize blame for difficulties and to withdraw from further interactions. In general, it appears that some children with LD may have reduced social adaptation in the classroom and less interpersonal understanding — and consequently fewer friendships — than their normally achieving peers. Finally, some students with LD are very sensitive to the negative reactions experienced in social interactions and they may withdraw.

These difficulties persist as children mature. In the NLST2, only 11.3% of youth with LD rated their social skills as high (Wagner, Newman *et al.*, 2004). Adolescent males and females with LD have been found to be less competent in the conversational and social problem-solving skills — traits that have been previously identified as underlying friendships. This was supported in a study where boys in the LD group (n=30) generated fewer advice statements than those in the non-LD group (n=37). The LD group also appeared to take a less dominant or aggressive position in the interrelationships (Hartas & Donahue, 1997).

In adults, the presence of social difficulties is well supported. In fact, it appears that the social problems associated with LD have a direct impact on many of the major life

demands of adulthood. Markers of difficulties in the social domain for adults with LD are partially based on slow language processing rates and deficits in verbal fluency and interpreting verbal or visual input (such as reading sarcasm or facial expressions — the pragmatics of social situations) (Vogel & Forness, 1992). These authors also found a significant relationship between non-verbal LD and psychosocial functioning deficits. Specific elements of social functioning on which language LD and non-verbal LD have been observed to have a negative impact include self-esteem, feelings of competence, levels of anxiety, depression, suicide and suicidal thoughts, and emotional stability.

Nevertheless, one study of adults and their self-adjustment found that there was little difference between the LD sample (n=40) and the non-LD sample (n=41) in terms of friendships (87% of adults with LD could identify a friend they could talk to about personal difficulties) (Lewandowski & Arcangelo, 1994). Additionally, these adults with LD had similar rates of being married or single. This contrasts with the results of a study that followed students with and without LD who had graduated from college between 1980 and 1988. Forty-two per cent of the LD group was single and 50% married versus 20% and 66%, respectively, for the non-LD group. In addition, there was a 6% higher divorce rate for the non-LD group (Vogel & Adelman, 2003). However, using a sample of mildly handicapped students, 80% of whom had specific LD, social acceptance was found not to be related to job success (S. Siegel & Gaylord-Ross, 1991).

## **SELF-CONCEPT, SELF-ESTEEM AND SELF-DETERMINATION**

Self-concept, self-esteem and self-determination are influenced in large part by an individual's cognitive and social abilities and the interaction of these abilities within varied environments, including home, school and the workplace.

### **Self-Concept**

Self-concept is the result of cognitive self-appraisal. It has been conceptualized as being multi-dimensional and composed of general self-concept (which includes non-academic self-concept) and two types of academic (English, mathematics) self-concept (Marsh & Hattie, 1996). Most studies reveal that students with LD rate their academic self-concept as lower than do their normally achieving peers without LD, while the two groups' general self-concept does not differ. The impact of children's self-assessments remains unclear (Cosden *et al.*, 1999). A small study (n=19) comparing children with LD to their siblings concluded that they do not differ in their general self-concept or in their academic self-perception. However, parents in this same study rated the children with LD as less socially competent and as having more behaviour problems (Dyson, 2003).

For the most part, students with LD are recognized as having a lower evaluation of their academic competency than their normally achieving peers. One study examined the ratings of 124 middle-school children (50 with LD and 74 without) and found that students with LD scored significantly lower on self-concept scales related to intellectual and academic functioning, but not on ratings of general self-concept (Gans *et al.*, 2003).

A study of two groups (with and without LD) of high-school youth (age mean=16.7 years) resulted in significantly lower ratings on a self-concept instrument (Scholastic Competence Scale) for the LD sample. In the second phase of the study, the LD group was divided between high and low scholastic competence self-ratings (Hagborg, 1999). A qualitative study of 11 secondary-school students, most of whom were at the end of their studies, indicated that 100% of those who had low scores for self-concept in the data analysis of four interviews had LD. They lacked confidence in describing themselves and exhibited no recognition of their LD. Only one-third of the group with high scores for self-concept had LD (Buysse *et al.*, 2003).

It has been argued that the low academic self-concept found in students with LD reflects a relatively honest self-appraisal given their academic underachievement (Howard & Tryon, 2002). However, others have found that high-school students with LD consistently overrated their academic skills relative to both parent and case coordinator ratings. Furthermore, when given academic tasks and asked to predict how well they would perform, they overrated their levels of performance, whereas parents and case coordinators were more accurate in their predictions (Stone & May, 2002). These results are consistent with an earlier study of 57 teachers and 12 students in each of their classes (six students with LD and six without LD). A sharp discrepancy was found between the self-perceptions of students with LD of average performance and their teachers' perceptions of below-average performance on nine elements of academic and organizational competence (Meltzer *et al.*, 1995).

Few studies exist on self-concept and adults with LD. One study compared 40 adults who had received special education for their LD to 41 adults who attended regular classes. It found similar ratings for self-reports of social adjustment and self-concept (Lewandowski & Arcangelo, 1994). This is an area that requires further study.

The results of these studies indicate that the general self-concept of children, youth and adults with LD tends to be at the same level as their normally achieving peers. However, the academic self-concept of children and youth is lower. Evaluation of achievement levels and ability to accomplish tasks by students with LD is higher than the ratings of parents or teachers. In addition, few adult studies exist.

## **Self-Esteem**

Whereas self-concept involves cognitive self-appraisal, self-esteem represents an emotional reaction to the appraisal of oneself. Using a qualitative analysis of 12 adults with dyslexia, one study found that self-esteem problems emerged in many individuals as early as preschool, and that all reported problems in self-esteem by school age (e.g., feelings of failure, traumatic experiences when forced to read aloud, self-questioning of one's competence in academic tasks). Low self-esteem persisted into adulthood and gave rise to feelings of failure and difficulties in finding a satisfactory role in society (McNulty, 2003). Another study focusing on the individual's self-understanding of his/her LD reported that adolescents (grades 7-8) who were able to describe their LD had

lower academic self-esteem. However, higher general self-esteem was associated with social acceptance, physical attractiveness and appropriate behavioural conduct (Cosden *et al.*, 1999). Even for successful adults with LD, self-esteem appears to be weak. In another study, participants talked about fear of success and about being found out. Some adults with LD — particularly those adults who were considered to be more successful — reported feeling like an “impostor” (Shesell & Reiff, 1999).

## Self-Determination

Self-determination is defined by four essential characteristics: the individual

- acts autonomously,
- self-regulates his or her behaviours (e.g., evaluates options, initiates and inhibits actions),
- responds in a psychologically empowered manner (e.g., advocates for self, plans for the future), and
- has the mechanisms or processes to achieve goals (e.g., can hold plans in working memory while carrying them out).

Self-determination is a process that is reflected in the use of metacognitive and self-regulatory strategies. Dyslexic students have been identified as weak in the application of metacognitive strategies to better manage the memory demands of middle school, high school and university. This is a process that develops from late childhood into adolescence, and it is one that is crucial for adult success (Zimmerman, 2002).

Using a sample that combined both persons with LD and persons who were mentally challenged, self-determination data was collected from families during high school and one year after high-school graduation. Higher scores on measures of self-determination were associated with a stronger desire to live independently, have one’s own bank accounts, be more likely to be employed and have higher wages (Wehmeyer & Schwartz, 1997).

A fundamental part of dealing with the presence of a learning disability is acceptance and control (Paul J. Gerber *et al.*, 1992). Some factors that differentiated between highly successful adults with LD and moderately successful adults were internal components (e.g., desire, goal orientation) and external manifestations (e.g., persistence, adaptability to environment, use of creative compensatory strategies, support). Highly successful adults were found to have achieved success because of their acceptance of LD and their ability to find means to control its effect on their lives. Many graduates with LD seem to have a high level of awareness about their disability. As reported in one study, 26% took or asked for extra time to complete assignments during their studies, 15% asked for additional help and 13% carefully monitored their work (Adelman & Vogel, 1990). A study of postsecondary graduates with LD found that they continued to employ skills developed during their programs of study: setting goals and prioritizing, using time management skills, and using time outside work efficiently to complete tasks (Madaus *et*



*al.*, 2002). Non-graduates were found to have gained fewer insights from their school learning than graduates, and thus they did not apply this knowledge in the workplace (Adelman & Vogel, 1990).

Studies indicate that individuals with LD — from children to adults — have lower academic self-concept, lower self-esteem, more feelings of failure and weak skills to support self-determination. Low academic self-concept and low self-esteem combined with the presence or lack of skills for self-determination clearly affect social interactions with peers or supervisors in the workplace as well as success at all levels of schooling and employment.

## MOTIVATION

Motivation<sup>4</sup> in school contexts has been identified as being strongly influenced by a student's belief in his/her self-efficacy<sup>5</sup>. This belief, as well as interest, perceived value of the task and self-regulation to achieve goals, are identified as predictors of a child's and adolescent's willingness to engage in an activity (Wigfield *et al.*, 1998). Motivation has a critical impact on the achievement of all children, including those with LD.

At the elementary level (ages 8 to 14), one study found that the central self-reported variable contributing to the motivation of children with LD was “competence in attaining outcome” or task self-efficacy (Deci *et al.*, 1992). These authors targeted maternal support for autonomy, maternal involvement and teacher warmth as contributing to feelings of self-competence and to autonomy at the elementary level. At the secondary level, perceived teacher support for autonomy or the classroom context contributed most to motivation. Low self-efficacy was linked to low academic self-concept and low academic self-esteem.

However, not all studies have found a relationship between low task self-efficacy and motivation. Among 39 fifth-grade students studied (including 19 with LD), those with LD exhibited lower levels of metacognitive strategies to aid in reading comprehension, but similar levels of self-efficacy, intrinsic orientation and anxiety as their normally achieving peers without LD (Pintrich *et al.*, 1994). Additionally, children with LD were more likely to attribute failures to external causes (e.g., lack of help from the teacher) than to internal abilities.

The results from the Deci, Hodges *et al.* (1992) study are consistent with an adult study that found that motivation and attitude toward the whole experience of postsecondary education, specifically the teaching and learning environment, accounted for 28% of the variance in grade point average (GPA) scores. Significant differences were found

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<sup>4</sup> Motivation is defined as those internal and external forces that induce a person to act in a particular way.

<sup>5</sup> Self-efficacy is defined here as the student's belief or judgment that he or she has/does not have the competence to complete the task. Positive self-efficacy is seen as strongly influencing students' learning and students' outcomes (Bandura, 1977).

between graduating and non-graduating students on factors considered by the authors to measure aspects of motivation such as delay avoidance, teacher approval, educational acceptance, study attitude and orientation. The two factors that most accounted for the variance in educational attainment or higher success rates were teacher approval (21%) and educational acceptance (14%) (Vogel & Adelman, 1990).

Human motivation is seen as resulting from “complex structural learning processes” (Pascual-Leone & Johnson, 2004). For students, it involves a variety of variables as reflected in the literature: self-efficacy, self-concept, and perceived support from mothers (at the elementary level) and from teachers (at the secondary and postsecondary levels). One indicator that appears consistently in both the Canadian and American literature is the attribution of failure by students with LD to external factors rather than to internal sources (Brooks, 1992; Bryan, 1989).

Since the literature addressing motivation in adults with LD is extremely limited and that that does exist is strongly tied to learning in very specific situations, such as teacher learning, medical or engineering education, and it is not appropriate for this paper.

## **PERSEVERANCE**

Perseverance is defined as the consistent pursuit of goals despite learning difficulties. One group of researchers conducted a qualitative study of 12 successful young people (aged 19 to 21, along with one 45 year old) with LD who were also classified as gifted (Reis *et al.*, 1997). Despite their giftedness, these individuals experienced many negative consequences of having LD. When asked why they eventually became successful, they most frequently cited their strong work ethic as their greatest asset and commented that it had developed in direct relation to their school experiences. In a qualitative study involving two interviews with 14 adults (aged 26 to 60) with LD, participants saw positive benefits from having LD and thought that the experiences had made them better people: more sensitive to and supportive of others (Shesell & Reiff, 1999). Others believed they had become more creative problem-solvers (Reis, Neu *et al.*, 1997).

Finding ways to pursue activities of personal strength was related to success. One key factor appeared to be the extent to which each individual had excelled in some area of his/her life outside of school (Reis, Neu *et al.*, 1997). A qualitative study noted that one pattern of reaction to having a disability was to develop an area of expertise where success would foster self-confidence in that domain. However, this self-confidence did not extend to other areas (McNulty, 2003). Another longitudinal study of 41 individuals with LD found that the best predictors of success were being self-aware, persevering, being proactive, having emotional stability, being able to set goals and receiving social support (Raskind *et al.*, 1999).

## SKILLS OF INDEPENDENT LIVING

Halpern (1985) argued that successful adulthood involved not only success in the workplace but also successful social and interpersonal adjustment. Indicators include living independently, supporting oneself financially and being involved in community activities (Halpern, 1985). The majority of persons with LD have the ability to live independently if they gain proficiency in reading, writing and math to a level that has been termed “functional literacy” (Cronin, 1996).

Students who graduate from high school have a different profile for independent living than those who leave before receiving their secondary level diploma. Blackorby and Wagner (1996) found that 14.7% of their LD sample was living independently after high school, as compared to approximately 30% for the non-LD group; however, three to five years later, the rate of independent living for the LD group had increased significantly to 44.1%. Therefore, it appears that young adults with LD have a longer adjustment period or a longer period of lower wages after high school before they achieve independence. Another study reported that only 20% of individuals with LD lived independently one year after high-school graduation, with females showing a slightly higher independent living rate than males (27% and 18%, respectively) (Stilington *et al.*, 1992). Of these young adults with LD, approximately 90% were single. Those with LD who had dropped out (35.0%) or aged out (21.9%) of high school were less likely to be living independently three to five years after high school than those who had graduated (Blackorby & Wagner, 1996).

In general, having some level of postsecondary education increases the likelihood of independent living. Researchers found that 20 years after exiting college 24% of individuals with LD who had graduated from postsecondary education were married and living on their own, 44% were single and living on their own, and 32% were single and living with parents (Raskind, Goldberg *et al.*, 1997). In a similar study, it was found that 79% of students who had attended some type of postsecondary education were living independently or with a spouse, while the remaining 18% were living with relatives (Rogan & Hartman, 1990). As noted in both studies, a significant percentage of the individuals studied continued to live with their parents or with relatives.

Persistent underlying problems can continue to affect aspects of daily living for adults with LD. A qualitative study involving 14 adults (aged 26 to 60) with LD — of whom seven were university graduates — reported that underlying difficulties in reading interfered with activities ranging from reading legal documents and summarizing what was read to reading restaurant menus. In addition, problems in visual-spatial functioning hampered their ability to follow directions, drive a car or remember right from left. Coordinating the many tasks of daily living continued to be problematic. The authors concluded that the impact of LD on daily living is not only pervasive, but also insidious (Shesell & Reiff, 1999).

## INVOLVEMENT IN COMMUNITY AND LEISURE ACTIVITIES

The pursuit of outside interests and activities is seen to add to the quality of an individual's life. Children may be involved in school or community activities such as sports activities, scouting or arts and crafts courses. In adolescence and adulthood, community service and other social activities outside of school may be pursued.

A random sample of 64 students with LD (mean age of 21) who had attended self-contained classes in 12 high schools expressed satisfaction with their community involvement and social activities. However, the actual number engaged in social activities was low (two men and one woman) when compared to persons without LD (Haring *et al.*, 1990). The NLST2 found that 68% of students with LD reported participating in at least one group activity: 49% in a school activity and 51% in a community activity. Forty-three per cent reported participating in community service or volunteering (M. Wagner *et al.*, 2004). A study that compared students with LD who chose to go on to postsecondary school (n=250) to those who did not (N=289) found the postsecondary group more involved in extracurricular activities while in high school, whether it was athletics, music, drama or debate (Miller *et al.*, 1990).

Youth with LD who do not pursue an education after high school were found to participate less in community activities. Accessing such activities did not appear to be a problem.

## COMMUNITY ADJUSTMENT PROBLEMS

Although higher levels of negative behaviour, such as bullying, delinquency and aggression, have been thought to be associated with individuals with LD, the evidence from various studies remains inconclusive. This is further complicated by the fact that statistical reports (Harlow, 2003) often do not adequately differentiate between those individuals who have a learning disability and those who have a mental handicap.

In a longitudinal study, 65 persons diagnosed with LD between the ages of 8 and 12 were interviewed at median ages of 18 and 25 in regard to persisting or non-persisting delinquency. There were no differences between the groups on measures of academic achievement, being rated as a discipline problem by parents or in acting-out behaviours. However, the group who continued to have problems (persisters) had received more special help in school, had poorer judgment and higher impulsivity, and had engaged in a greater use of alcohol (Waldie & Spreen, 1993). Another longitudinal study of 515 fifth-grade students (including 51 students with LD) over a period of seven years found no direct relationship between LD and delinquency (Malmgren *et al.*, 1999).

Having LD was not in itself a marker for delinquency. In a longitudinal study of 22 children (matched by age, sex, ethnicity and socio-economic status) who were followed at ages 17 and 18 and again in their 30s, it was found that 27% had contact with police and had "delinquency records." However, in their 30s, less than 10% had criminal

records (Werner, 1990). Finally, a critical review of the relationship between aggression and reading disabilities in children and adolescents concluded that childhood reading disabilities do not lead to aggressive or delinquent behaviour, but that reading disabilities might worsen pre-existing externalizing behaviour problems (Cornwall & Bawden, 1992).

A Canadian study examined the prevalence of arithmetic and reading difficulties in adolescents at a homeless/runaway shelter. A high percentage (52%) had a reading disability, while a significantly smaller percentage (28.5%) also had arithmetic/written work difficulties. Only 19.5% were achieving normally (Barwick & Siegel, 1996).

A Swedish study of 70 inmates in a juvenile institution (median age of 15.9) with literacy issues found that 11% had dyslexia as defined by phonological difficulties. However, the authors concluded that other factors were influential in the development of delinquency (Svenson *et al.*, 2003). These included linguistic and cultural factors characterized by poor mastery of school language and little linguistic stimulation; home environmental factors characterized by parental neglect; and school-based factors, such as frequent school and teacher changes, weak attendance, and inappropriate types of instructional interventions.

## **GENDER AND PERSONAL/SOCIAL CHARACTERISTICS**

The topic of gender and personal/social characteristics is seldom directly addressed in the research literature and, when it is commented upon, the results are mixed. In the aforementioned study on at-risk kindergarten children (Al-Yagon 2003), mothers of boys identified their children as having a more secure attachment and a stronger sense of coherence and family cohesion than the mothers of girls. In contrast, teachers rated girls as being better adjusted than boys.

In the previously cited study on autonomy and competence as motivational factors (Deci *et al.*, 1992), the sample of males with LD outnumbered females at the elementary level (50 to 23) and again at the secondary level (120 to 59). However, there were no differences by gender on the scales used to measure autonomy or competence. The sample with LD was identified by the school district, underlining the fact that boys with LD continue to be identified at a higher rate than do girls with LD.

Self-perception is an area in which differences have been noted. A Canadian study considered the non-academic self-perceptions of 83 students in grade 5 and 88 students in grade 8 (Heath & Wiener, 1996). Lower self-perception of physical attractiveness was related to depression for girls with LD but not for boys with LD. Males with LD reported higher self-perceptions of athletic ability than did females with LD, but the males with LD had lower self-perceptions of their behavioural conduct.

## INDICATORS

Personal and social indicators cover areas that characterize how the individual feels about him/herself and how the individual interacts with others. Table 2 outlines these indicators.

**Table 2: Personal and social indicators associated with LD**

<b>Age Group</b>	<b>Indicators</b>
<b>2.1 All Age Groups</b>	2.1.1 Difficulty establishing and maintaining relationships with significant people (e.g., parents), remains single or gets divorced 2.1.2 Social isolation (e.g., difficulty making and keeping friends, low involvement in community (e.g., volunteering, religious affiliation, clubs or leisure activities)) 2.1.3 Difficulty in social interactions or social problem-solving 2.1.4 Self-reported difficulties in language use (e.g., word retrieval, misreading a joke or tone of voice, difficulty with listening) 2.1.5 Low academic self-concept (e.g., self-report of weak ability to accomplish reading, writing or arithmetic tasks) 2.1.6 Low self-esteem (e.g., feelings of failure, low self-confidence) 2.1.7 Low self-determination (e.g., low self-awareness, low recognition of LD, not advocating for accommodations) 2.1.8 Low engagement in educational activities (e.g., unmotivated, “lazy”, avoids academic tasks) 2.1.9 Inaccurate self-perception (e.g., higher social self-assessment than that of parents or teachers) 2.1.10 Involvement with the law
<b>2.3 Young Adults/Adults</b>	2.3.1 Inadequate life skills (e.g., weak skills in self-management, self-care, including taking medications, organizing, accessing support or health services, and in daily living, including banking, shopping and preparing meals) 2.3.2 Living with parents or relatives after leaving/completing secondary or postsecondary studies 2.3.3 Homelessness or extended absences from home (e.g., no fixed address, runaways)

## 4.0 EMPLOYMENT

Research on employment and adults with LD is limited and is largely based on school-identified samples — individuals who have been followed since school departure. Often adults with LD have not been formally diagnosed, but they self-report difficulties in reading, writing or mathematics and/or placement in special classes or receipt of educational support. This section is organized to explore research pertaining to rates of employment, job types, wages earned, job satisfaction and promotion opportunities, frequency of job changes and time in job, successful employment, employer issues, and gender. The section ends with a table that details employment indicators associated with LD.

### RATES OF EMPLOYMENT

All of the statistics in this section come from American literature. Longitudinal studies on rates of employment were not found for the Canadian population with LD. This is a category where those with learning disabilities are included under the heading “disabilities” and, therefore, comparisons are not possible.

The NLST1 reported that the employment rate for youth with LD who were out of school for three to five years was 71% working and 57% working full-time. These rates were higher than for other groups of persons with disabilities (Blackorby & Wagner, 1996). Similar employment rates of approximately 70% and unemployment rates of approximately 12% have been found across studies (e.g., Brown, Johnson, 2003; Stilington, Frank *et al.*, 1992). However, young adults with LD who had attended self-contained classes in high school had an unemployment rate of 32% — a rate three times the national average. Of those employed, few were in full-time employment and most were being paid lower wages (Haring *et al.*, 1990).

Some studies have examined whether vocational courses enhance employment for students with LD. One study found that 84% of the LD sample that had had general vocational training in high school was in competitive employment one year after graduation, and that this rate of employment was comparable to graduates with specialized vocational programs (Stilington *et al.*, 1992). A second study questioned the value of vocational programs for persons with LD as the programs lacked many of the job-related and job-specific skills needed, and less than 50% of those who were employed were in positions related to their prior vocational training (Shapiro & Lentz, 1991).

Comparing dropouts to graduates with LD, one study in a rural setting using a sample of individuals with mild disabilities (66% of whom were individuals with LD) found that graduates were significantly more likely to have had work experiences during high school (90% versus 59%) and to have held significantly more jobs during high school (Karpinski *et al.*, 1992). A second study found similar higher rates of employment for those students with LD who had part-time work in high school (Fourquerean *et al.*, 1991).

Non-graduates in postsecondary studies had a lower rate of employment than graduates. In a 20-year longitudinal study, Raskind, Goldberg *et al.* (1999) reported that 46% of adults with LD were employed full-time, 12% were employed part-time and 42% were unemployed. Many of these adults had entered college previously but had failed to complete their degrees. For postsecondary graduates, differences were found between the full-time employment rates of those with LD (72%), as compared to individuals without LD (85%) (Vogel & Adelman, 2003). Similar studies have found full-time employment rates at approximately 80% (Greenbaum *et al.*, 1996; Witte *et al.*, 1998). Rogan and Hartman (1990) found a 79% full-time employment rate for postsecondary graduates with LD, whereas those individuals with LD who had a high-school diploma were employed at a rate of 69%.

## **JOB TYPES**

The expectation for lower-prestige occupations in those individuals with LD begins in adolescence. One study found that 70% of grade 12 adolescents with LD held occupational aspirations lower than adolescents without LD (Rojewski, 1996). Students with LD were less inclined to consider postsecondary educational programs and needed greater instruction in career exploration and job seeking (Dowdy *et al.*, 1990). Although finding an 86% full-time employment rate, another study found that almost all jobs were at the entry level (Fourqurean, Meisgeier *et al.*, 1991). Adults with LD have been reported not only to be underemployed given their experience, but also to have less status than employees without LD (White, 1992).

For adults with LD who had no postsecondary education, the most common job classifications were in the field of labourer (37%), service worker (27%) and operative (12%) (Stilington *et al.*, 1992). For adults with some postsecondary experience or for postsecondary graduates, jobs tended to be concentrated more in the business sector (Adelman & Vogel, 1990). Other studies report that, in general, individuals with dyslexia tend to opt for more people-oriented professions (e.g., sales, marketing) where the environment is less controlled and more flexible towards an individual's specific capabilities (Taylor & Walter, 2003). Another study reported that the majority of adults with LD chose executive, managerial and administrative jobs and marketing or sales jobs (Witte, Philips *et al.*, 1998). A higher concentration in managerial jobs, followed by sales and then other categories, has also been reported for postsecondary graduates with LD (Greenbaum *et al.*, 1996; Madaus *et al.*, 2002).

## **WAGES EARNED**

Among youth with LD who were out of school for three to five years, pay rates appeared similar between high-school graduates and non-graduates. A recent study of 166 high-school graduates with LD and 315 graduates without LD confirmed the higher earnings in the first five years after graduation for persons with LD; however, after year six, their peers without LD surpassed them and the gap continued to widen during the last four years of the study. The authors noted that this result might be explained by the fact that



more graduates without LD continue on to some postsecondary education after high school (Goldstein *et al.*, 1998). The lower pay rates experienced by some adults with LD have been attributed to some of the struggles these individuals have in adapting to independent living (Blackorby & Wagner, 1996).

Recent findings for postsecondary graduates suggest pay rates for those with LD are very similar to those without LD in the workplace (Witte, Philips *et al.*, 1998; Madaus, Foley *et al.*, 2002). An additional study found that 49% of individuals with LD had received a pay raise at their current job (Greenbaum, Graham *et al.*, 1996). When there appears to be a wage gap between people with and without LD, the gap can be attributed to less productivity in a particular industry on the part of the person with LD (D. K. Dickson, 2002).

## **JOB SATISFACTION AND PROMOTION OPPORTUNITIES**

Despite being paid at a lower rate and being in entry-level positions, one study found that 87% of high-school graduates with LD had a high rate of job satisfaction (Haring, Lovett *et al.*, 1990). Other researchers have reported that 94% were satisfied with their jobs, and that 80% of those who were employed stated that there were opportunities for advancement within their present jobs (Greenbaum, Graham *et al.*, 1996). These results are also reflected in a study comparing American and Canadian workers with LD. This study reported a high incidence of job advancement for both groups (Paul J. Gerber *et al.*, 2004). Job satisfaction has been linked to the opportunity to advance in the workplace and the variety of tasks that are available (Houser & A., 1993). Similar rates of satisfaction for those individuals with LD who have post-graduate training have been found across several studies (Rogan & Hartman, 1990; Witte, Philips *et al.*, 1998). In a study of 132 postsecondary graduates, indicators of job satisfaction were identified as perceptions of employment self-efficacy and the use of self-regulatory strategies or accommodations (Madaus, Ruban *et al.*, 2003). Accommodations included using technology, taking additional time on reports and getting more detailed directions from supervisors.

Of those who were unsatisfied with their jobs, it was found that the majority of individuals with LD thought they were not adequately compensated for their labour and that they received fewer promotion opportunities than their colleagues. Many of those with LD held the perception that their co-workers without LD were paid more and were more adequately compensated for their hard work (Witte, Philips *et al.*, 1998).

## **FREQUENCY OF JOB CHANGES AND TIME IN JOB**

There appears to be a growing body of evidence that suggests that individuals with LD change jobs more frequently; this is true even for those who have been in the workforce for over 30 years (McAfee & McNaughton, 1997; Stilington *et al.*, 1992). Results from a recent study produced the same outcomes: those with LD demonstrated more job changes and were employed in their present jobs for less time than workers without LD. However,

within the population of college graduates with LD, an inconsistent pattern was found. Some of these graduates appeared better able to adapt from college to the workplace, find full-time employment and remain consistently employed. Others paralleled the experience of secondary graduates or non-graduates and consistently demonstrated a history of part-time work and frequent job changes (Vogel & Adelman, 2003).

## **SUCCESSFUL EMPLOYMENT**

Several factors have been associated with successful employment. Personal characteristics and positive life experiences have been identified as important indicators of job success (McAfee & McNaughton, 1997). Another critical factor is strong verbal abilities (e.g., recall of factual information, well-developed vocabulary, knowledge of how to react in social situations) (L. A. Faas, 1990). In addition, math ability was among the strongest predictors of successful employment (L. Faas & D'Alonzo, 1990; Fourquerean *et al.*, 1991).

Finding a job matching one's level of literacy appears to be one of the hallmarks of success. In a previously cited study of subtypes of adults with LD who were served by vocational rehabilitation services, different subtypes were found to be more frequently associated with specific types of positions (Dunham *et al.*, 1999). Those with LD tended to avoid jobs that involved a lot of formal reading and writing, although those who were college graduates are more likely to be employed in these areas than were non-college graduates (Rogan and Hartman, 1990).

## **EMPLOYER ISSUES**

A survey of supervisors in human services, business and industry regarding employees with LD who had taken part in a program that trains persons "with specific learning disabilities and low intelligence" for employment produced some positive findings (Reisman & Reisman, 1993). This group was more dependable in coming to work and being on time, accepting constructive criticism, and having a positive work attitude. Problem areas mentioned at least twice as often for the LD group included insecurity regarding work role, low self-esteem, problems with memory, distractibility, impulsivity, and difficulty following directions and transferring learning to a similar, but new, situation. The supervisors noted that social relations were affected negatively by impulsivity and perseveration in repetitions and verbalizations.

Another study suggested that certain personal characteristics associated with individuals with LD in the workplace (e.g., staying later to complete work, need for proofreaders) might lead employers to see the college graduate with LD as having less value in the workplace in terms of productivity (D. L. Dickson & Verbeek, 2002). In the previously cited comparison study of Americans and Canadians with LD, employers were found to have a wide range of reactions to the disclosure of LD by employees and possible employees (Paul J. Gerber *et al.*, 2004).

However, persons searching for employment seldom told their employer that they had LD due to fear of discrimination. Many college graduates were reported to believe that they would not be hired if they disclosed their LD; therefore, 57% refused to reveal their disability after they were hired, and only 22% of participants had accommodations made (Greenbaum, Graham *et al.*, 1996). Madaus, Foley *et al.* (2002) found that 30.3% of their sample self-disclosed their LD to their employers — a rate that has been found more consistently in other studies (e.g., Adelman and Vogel, 1990).

## **GENDER AND EMPLOYMENT**

Several studies have reported differences in employment by gender. Stilington, Frank *et al.* (1992) and Haring, Lovett *et al.* (1990) found females with LD who had received special education support and had graduated were earning significantly less salary than males. In this same study, full-time employment was significantly less for females than males. Blackorby and Wagner (1996) reported that among high-school graduates with LD who were out of school for three to five years, males were employed 76% of the time, while females with LD were employed at a rate of only 53%. Some differences can be attributed to the fact that more women were parenting, many of whom were found to be unemployed, not in school and unmarried (Levine & Edgar, 1995). Regarding career aspirations, one study found that males with LD were twice as likely not to aspire to higher-prestige occupations as students without LD, and females with LD were 1.5 times as likely not to aspire to higher-prestige occupations (Rojewski, 1996).

## **INDICATORS**

Employment indicators refer to paid work for young adults or adults only. Since both LD and non-LD adolescents tend to work part-time in service or labourer jobs, indicators are not provided for this age range. The indicators for young adults and adults are detailed in Table 3 on the following page.

**Table 3: Employment indicators associated with LD**

<b>Age Group</b>		<b>Indicators</b>	
<b>3.A</b>	<b>Young Adults/Adults</b>	3.A.1	Unemployment or part-time employment
		3.A.2	Underemployment: Lower wages than for adults of the same age and educational level
		3.A.3	Vocational or technical training in secondary or post-secondary, apprenticeship training, or transition-to-work programs
		3.A.4	No postsecondary education: Lower status jobs/occupation (e.g., labourer or service worker)
		3.A.5	With postsecondary education: Occupations in business, management, sales or marketing
		3.A.6	Lack of promotions (e.g., remaining at the same level of work for several years)
		3.A.7	Frequent job changes
		3.A.8	Self-report of negative work evaluations by supervisors (e.g., low productivity, does not follow directions, lacks initiative, insecurity regarding work role, distractible, impulsive, difficulties getting along with co-workers)

## 5.0 PARENT/FAMILY

Parents and extended family are identified as supports throughout a person's lifespan. The presence of these supports can assist the person with LD to be more successful in school, postsecondary education and employment. These influences begin with the genetic inheritance that parents pass on to their offspring, their involvement in the child's education and the environment they create in the home. Additionally, family support is identified as helping persons with LD obtain employment. Finally, the socio-economic status of the family is identified as influencing the academic achievement levels of the children.

It is important to note here that reading difficulties can arise from both genetic and environmental causes. The previously mentioned Svenson (2003) study on the nature of reading difficulties indicates that poor reading skills can arise from a variety of environmental sources (e.g., linguistic background, lack of stimulation, chaotic family dimensions, inappropriate teaching methods). This section is organized to take the varied causes of reading difficulties into account, but to focus on studies of LD rather than the broader category of reading difficulties. The subsections are structured in the following order: genetic influences, early parenting influences, parental involvement, family structure and relationships, linguistic differences, socio-economic status, and gender. This section concludes with a table that details parent and family indicators for LD.

### GENETIC INFLUENCES

Although not all types of LD have been identified as being genetically influenced or determined, it has become increasingly evident that the risk of reading disabilities is stronger for children where similar difficulties have been manifested in members of the nuclear (e.g., parents) or extended (e.g., grandparents, uncles, cousins) family. In one study, a range of 25% to 60% of children who had parents with reading difficulties was found to develop similar disabilities. Fathers were seen as having a higher level of influence (46% as compared to 33% for mothers) (Wood & Grigorenko, 2001), while a stronger influence for phonological disorders has been reported in the nuclear rather than the extended family (B. A. Lewis, 1992). A recent study of the genetic component of dyscalculia<sup>6</sup> investigated 39 children, 21 mothers, 22 fathers, 90 siblings and 16 second-degree relatives and found that the familial prevalence of dyscalculia was 10 times higher than in the normal population (Shalev *et al.*, 2001).

### EARLY PARENTING INFLUENCES

Parental involvement with children begins from an early age. In one longitudinal study, failure to provide a strong early literacy environment (e.g., talking to babies, reading to children, generally involving children in varying types of home activities) was associated with lower reading achievement (V. J. Molfese *et al.*, 2001). Another study compared the

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<sup>6</sup> Dyscalculia is defined as a specific learning disability in mathematics.

play behaviour of 49 mothers with specific reading disabilities in situations with their 14-month-old children who were considered at risk of developing reading disabilities. Mothers with reading disabilities produced significantly less symbolic play (e.g., pretend play) and language interactions (e.g., mother verbally cues symbolic play) with their children. It was suggested that this may weaken the development of typical linguistic representations in children at risk for reading disabilities (Lyytinen *et al.*, 2003).

Early differences in home environment have been shown to directly impact on adult outcomes. Using a literacy environment composite score, researchers reported a direct relationship with outcomes in intelligence, word reading, reading comprehension and spelling in a sample of adult males with reading disabilities (Samuelsson & Lundberg, 2003).

An interesting outcome from another study was the emergence of a positive factor for parents with LD: having a child with a learning disability allowed them to better understand their own learning disability (McNulty, 2003).

## **PARENTAL INVOLVEMENT**

Parental involvement in the school life of a child or adolescent with LD has been identified as a strong component in the child's successful completion of secondary school. This influence continues throughout the lifespan of persons with LD as they seek employment and become members of the workforce (Paul J. Gerber *et al.*, 2004). However, compared to parents of general education students, parents of students with LD had lower levels of home and school partnerships, were less likely to know where the adolescent was in the home, were less participative in home/school conferences, and were less involved in home learning (Deslandes *et al.*, 1999). Thus, key factors influencing the graduation of students with LD include the extent to which their families encouraged learning, expressed high expectations and became involved in the school (Blackorby and Wagner, 1997).

When parents were more involved with the high-school program, the children and youth with LD were more likely to go on to postsecondary education. Interestingly, another study of 180 sixth-grade, 141 seventh-grade and 115 eighth-grade students, including 40 students with LD, concluded that both those with LD and without LD perceived parents as being equally supportive, but those with LD perceived less support from peers than did those without LD (Wenz-Gross & Siperstein, 1998).

Finally, there are three other reported findings for the involvement of parents. They were associated with high-school students with LD missing five less school days per year and being 25 percentage points less likely to fail a class, independent of socio-economic status (Blackorby and Wagner, 1996). As measured by percentage of IEP meetings attended, school involvement was one of the strongest predictors of employment success among high-school graduates with LD who were followed one to three years later (Fourqurean, Meisgeier *et al.*, 1991).

## **FAMILY STRUCTURE AND RELATIONSHIPS**

Besides parental involvement in the school, family structure as it impacts on financial and available time resources has been identified as influential in the success of children and youth. In the Quebec study referred to earlier, the traditional two-parent family was less common for secondary students with LD (69%), as compared to those without LD (81%) (Deslandes, Royer *et al.*, 1999). In addition, according to the NLTS2 (U.S., 2001), 31% of students with LD came from single-parent families, as compared to 23% for the general population (M. Wagner *et al.*, 2003b). Comparing the National Health Interview Survey data (U.S.) for the years 1983 and 1996, Fujiura and Yamaki (2000) found a strong association of children with disabilities in single-parent families. Poor family intactness was linked with increased school transfers and number of school removals, while school removals have been associated with higher rates of dropout for students with LD (Kortering *et al.*, 1992).

Increased parental stress has also been related to having a child or youth with LD, but this increase in stress did not appear to extend to stress within sibling relationships. A Canadian study investigated the family experiences of 19 sibling and parent pairs, where one child in the sibling pairs had been diagnosed as having LD (Dyson, 1996). The results indicated significantly more parental stress for those who had a child with LD, as compared to a control group who did not have a child with LD, although there were no differences found in the level of dysfunction in sibling relationships. These results were confirmed in another study, which found that self-concept of siblings of children with LD were within the normal range, although they did score slightly higher on externalizing behaviours (Lardieri *et al.*, 2000).

Siblings were also reported to have been involved in normal social activities (e.g., extracurricular involvement) and were not pressured to earn high grades because of the difficulties their siblings may face. Those children who have a sibling with LD were reported to have feelings of love and affection toward that sibling with LD and no feelings of resentment toward him/her. A longitudinal study of 22 children (matched by age, sex, ethnicity and socio-economic status) that followed the children at ages 17 and 18 showed little academic improvement, but for those who did improve, their success was credited to the sustained emotional support of family, friends and elders. When followed into their early 30s, many of the 22 participants had made a successful adult adjustment. Among the factors associated with such success were parental competence that fostered self-esteem, maternal education beyond high school, and the presence of rules and structure in the home (Werner, 1990).

## **LINGUISTIC DIFFERENCES**

Ethnic and cultural differences can result in additional problems for persons with LD. While there is limited research available that looks at different cultural and ethnic groups, most of that research has been carried out in the United States with Mexican-American children and their families. This is the case because one-fifth of immigrants to the United

States are from Mexico (Statistics Division, August 2002). Immigration patterns differ in Canada, where more than 35% of immigrants are from Asia. In 2002, 14.51% came from the People's Republic of China, 12.58% from India and 6.18% from Pakistan (Citizen and Immigration Canada, 2003). Thus, studies of Asian persons with LD would prove more fruitful to understanding the contribution of ethnic differences. Poon-McBrayer and Garcia (2000) examined profiles of Asian-American students diagnosed as LD in a large Texas school district and found that less than 1% had been identified as having LD. They concluded that identification practices may not be appropriate for this population and remarked on the "paucity" of studies on Asian-American students with LD (Poon-McBrayer & Garcia, 2000).

As well as ethnic differences, cultural differences may compound problems for those with LD. For example, some Aboriginal Canadians may face the challenge of learning English or French as a first language or a second language or of learning both languages concurrently within the school curriculum. Although unable to locate research studies that examine the rates of learning and/or reading disabilities among Aboriginal Canadians or the challenges unique to this population, it is known that the rates of Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) are significantly higher among Aboriginal Canadian children than in the overall population (Canadian Paediatric Society, 2002). In addition, there is growing evidence that the psycho-educational profile of FAS is similar to that exhibited by children with non-verbal LD.

## **SOCIO-ECONOMIC FACTORS**

Disadvantaged socio-economic status, as defined by family income, parental education level and occupation, has been identified as having a significant impact on families of children and youth with LD in the following areas:

- health (e.g., hunger, under-nutrition during pregnancy, limited health care access),
- productivity (e.g., delayed cognitive development, limited access to leisure activities),
- physical environment,
- emotional well-being (e.g., increased stress, low self-esteem), and
- poor family interaction (e.g., inconsistent, unresponsive parenting, marital conflict over money, increased sibling responsibilities) (Park *et al.*, 2002).

Please note that occupational status has been addressed in the Employment section of this paper and will not be discussed here.

Multiple factors have been linked to the increased probability of children being identified as having LD. A low level of maternal education, late prenatal care, unmarried status and low birth weight have been found to significantly increase the extent to which children have a likelihood of being identified as having LD (Blair & Scott, 2002). These researchers found that the combination of these factors increased risk for a total of 30% of the male placements with LD and 39% of the female placements with LD. Therefore,



socio-economically disadvantaged risk factors do appear to have an influence on a child's susceptibility to having LD, as the presence of just one of these markers when a child is born increases the likelihood that they will be identified as having LD later in life.

The presence of more than one of these markers further compounds this likelihood. In a comparison of the National Health Interview Survey data (U.S.) for the years 1983 and 1996, the authors found an association between poverty and LD disability rates in the 1996 version of the survey (Fujiura & Yamaki, 2000). Data from the NLTS1 showed that more than 30% of high-school youth with LD came from homes in poverty, as compared to 18% for the general population. Another study (Buysse, Goldman *et al.*, 2003) reported that the educational levels of parents of students with LD were lower (12% of mothers had some postsecondary education; this rate was 18% among fathers) than the parents of the non-LD group (the rate was 29% for mothers and 40% for fathers).

In contrast, a longitudinal study of newborns and preschool children (n=96) found that socio-economic status was a weak predictor of language scores or reading ability in grade two (D. L. Molfese *et al.*, 2002). The evidence of the links between homes in crisis (e.g., poverty), low parental educational attainment and students having LD does exist, but the connections appear to depend on the definition of LD that is used. Some of these definitions do not differentiate LD from reading difficulties due to environmental impacts (e.g., poor teaching, poor home literacy environment).

## **GENDER AND FAMILY**

In a longitudinal study of 22 children (matched by age, sex, ethnicity and socio-economic status) who were followed into their 30s, a factor associated with successful adult adjustment for girls with LD was the model of a mother who had been gainfully employed outside the home (Werner, 1992).

## **INDICATORS**

Table 4 on the following page includes indicators related to the physical and family environment, birth, child care, and socio-economic status for the child with LD.

**Table 4: Parent and family indicators associated with LD**

<b>Age Group</b>	<b>Indicators</b>
<b>4.2 Children and Youth</b>	<p>4.2.1 Parent with LD, particularly fathers (e.g., parent who dropped out, with low level of educational attainment, low-status occupation, unemployment)</p> <p>4.2.2 Parents' self-reports of general health, stress, anxiety and depression</p> <p>4.2.3 Parents with co-existing mental health disorders (e.g., mood, anxiety, personality, eating and sleep, substance-related disorders)</p> <p>4.2.4 Parents' inability to access community support services (e.g., mental health, assessment)</p> <p>4.2.5 Sibling or other family members (e.g., grandparents, uncles, cousins) with LD</p> <p>4.2.6 Difficulties at birth or during mother's pregnancy, including low birth weight</p> <p>4.2.7 Mother's limited prenatal care or child's/youth's limited post-natal care</p> <p>4.2.8 Adopted</p> <p>4.2.9 Single-parent families</p> <p>4.2.10 Limitations in parents' adequate attainment of standard English or French (e.g., cultural or ethnic differences)</p> <p>4.2.11 Low literacy home environment (e.g., material for reading, language interaction with the child that promotes vocabulary growth, does not encourage learning)</p> <p>4.2.12 Low parent/school involvement (e.g., low attendance at IEP/report card meetings, volunteering, failure to access school services)</p> <p>4.2.13 Poverty</p>

## 6.0 HEALTH

This section on health covers five areas: general health; substance use and abuse; mental health, including relationships and social isolation, stress/anxiety, depression and suicide, and other disorders; co-existing conditions, specifically attention deficit disorders; and gender. The section concludes with a table that details the health indicators associated with LD.

### GENERAL HEALTH

In the NLTS2, which looked at 13- to 17-year olds in the United States, over 93.7% of the LD sample reported themselves to be in good to excellent health, a finding consistent with the non-LD sample. In addition, household income correlated with overall health (M. Wagner *et al.*, 2003a). However, some studies suggest that individuals with LD do not fare as well in terms of general health. Specifically, early childhood development of consistent earaches have been found to interfere with age-appropriate language development (McArthur & Bishop, 2001).

Using data from the National Longitudinal Study of Adolescent Health (U.S.) involving grades 7 to 12, researchers found that males and females with LD were twice as likely to be involved in violent behaviours or to have witnessed or been the victim of a violent act. This was particularly true for girls with LD. In addition, this study found that males with LD reported initiating intercourse at a younger age than their peers without LD. As well, this group was three times more likely to have had intercourse before the age of 12 than their non-LD peers (Svetaz *et al.*, 2000). However, this same study reported lower rates of substance use (alcohol, marijuana, cigarettes and other drugs) among the LD sample as compared to their non-LD counterparts. The National Household Survey on Drug Abuse reported that 11.4% of 12- to 17-year olds were currently using drugs (Weinberg, 2001).

### SUBSTANCE USE AND ABUSE

Substance use is defined as smoking cigarettes or marijuana or using alcohol or drugs. The area of substance use/abuse in adolescents or young adults with LD remains controversial. There are few scientific studies in this area, and those that exist caution that the general field of substance use and abuse is very complex. An early study (1994) in the United States reported that adolescents with LD in a sample population had a proportionately higher rate of smoking — both cigarettes and marijuana — than the non-disabled sample population; however, no differences were found for alcohol use (other drug use was not addressed). The authors noted that this rate is still lower than the American general incidence rate for adolescents (45% for cigarettes and 24% for marijuana) (National Institute on Drug Abuse, 1987 as cited in (Maag *et al.*, 1994). It is important to note that this study only investigated substance use and not abuse.

One longitudinal Canadian study examined children at age 12 and again as young adults at age 19 (n=264) to investigate rates of substance abuse (Beitchman *et al.*, 2001). This

study used speech and language measures, LD/academic measures, and psychiatric measures. They found that those who had LD at age 12 and continued to have difficulties at age 19 — defined by the authors as consistent LD — had a significantly increased risk of developing Substance Use Disorder (SUD).<sup>7</sup> Academic difficulties at age 12 were a good predictor of the development of SUD at age 19. The authors also found that the severity of the LD at age 19, particularly in spelling and math, increased the risk of developing SUD as an adult. There was no difference in the results for males and females.

One paper describing risk factors for SUD suggested that difficulties in executive cognitive functions (e.g., cognitive flexibility, attention, self-determination, working memory), academic failure, low self-esteem and weak social skills might be among the predictors of SUD (Weinberg, 2001). Nevertheless, the author cautioned against making a direct link with LD and suggested that environmental and genetic influences also play an important role. Another paper reviewing five studies on the same topic (one study on children, one study on youth, one study on children and youth, and two studies on adults) found that a majority of those with LD do not abuse drugs or alcohol, but that those with LD are disproportionately represented among those requiring substance abuse treatment (Cosden, 2001). One of the studies compared 88 middle- and high-school students with LD to 103 students without LD in regard to substance abuse/chemical dependency. Overall, 15.7% of participants were classified as chemically dependent, and 70% of these participants had LD (Karacostas & Fisher, 1993).

Although the previous results imply that those who seek out treatment tend to have LD, other studies are not as conclusive. Using 25 consecutive male adult intakes to a detoxification unit, two researchers examined the presence of LD using psycho-educational testing and structured interviews (Rhodes & Raskinski, 1990). Although they reported that 60% of their sample met at least one criterion for identification of a learning disability, their results appear tentative at best given that their definition of LD included individuals whose IQs were not in the average range. The consequence of these studies is that although the increased incidence of substance use and abuse linked to LD is not supported, there may be some validity that those with LD tend to comprise a greater proportion of those in treatment.

## MENTAL HEALTH

Positive mental health is a significant contributor to the quality of an individual's life and arises when one achieves a balance in adapting to the demands of both internal and external environments. Mental health is supported by close relationships with meaningful others. In this area, as with other domains of functioning, the population with LD appears to be more at risk. Problems include lack of close relationships, feelings of loneliness, stress, depression, suicide and a higher incidence of other psychiatric disorders. One study indicated that students with LD struggled on a daily basis with issues such as mental health (Buysse, Goldman *et al.*, 2003). Data from the National Longitudinal

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<sup>7</sup> Substance Use Disorder is the current term used to describe substance abuse.

Transition Study of Special Education Students completed in 1994 and again in 2002 found an increase in those with LD who receive mental health services from 11.0% to 15.2% (Blackorby and Wagner, 1997).

### **Close Relationships and Social Isolation**

In a study of 196 children (98 with LD and 98 without LD aged 8 to 11), the results relevant to close relationships or attachment styles indicated that 55% of children with LD did not experience close attachment, avoided making attachments and had more anxiety in the attachments they did have, as compared to 29% of the non-LD group. The LD group also had a higher incidence of loneliness (i.e., a lack of feeling socially or emotionally supported) (Al-Yagon & Mikulincer, 2004).

Other studies have shown heightened feelings of loneliness among students with LD (Al-Yagon & Mikulincer, 2004; Tur-Kaspa *et al.*, 1998). Even in inclusive classrooms, where much of the evidence points to a greater likelihood of forming friendships, children with LD report feeling lonely. In a study of 29 students with LD (mean age=10), only 49% identified other children as providing social support and 38% looked to adults within the school setting to provide emotional support. Only 4% appeared to identify that both their social and emotional needs were met within the school setting (Pavri & Monda-Amaya, 2001). Males and females within the groups were equally likely to be affected (Al-Yagon & Mikulincer, 2004). Overall, these findings suggest that children with LD have a high likelihood of feeling lonely.

### **Stress and Anxiety**

Stress can be specific to a situation (e.g., exams) or it can be more diffuse (i.e., general anxiety). Both will affect the individual at school, in outside activities, during employment or unemployment and with relationships. Generally it appears that those with LD experience various types of stress and anxiety, but at higher levels than those without LD.

A study that considered the social adjustment of 40 youth with LD or mild mental retardation and 396 general education students at the secondary level concluded that those with LD experienced more academic stressors (e.g., keeping up with learning, following directions), which resulted in weak self-concept, more peer-related stressors (e.g., less ability to make and keep friends and to withstand peer pressure, more likely to be victimized) and more problems with rules and teachers (e.g., negotiating issues of autonomy, self-regulation, multiple teacher relations) (Wenz-Gross & Siperstein, 1998). Others reported higher levels of stress among youth with LD, particularly regarding stress about failing a class and being less likely to be chosen for an activity, than students without LD. As well, students with LD felt more distant from their peers; this suggests less support during periods of high stress (Bender *et al.*, 1999).

At the young adult and adult level, a study of 191 students with LD in postsecondary school reported more stress, more difficulty concentrating during exams, greater frustrations and greater anxiety about the time demands than those without LD (Heiman & Precel, 2003). In the qualitative study previously cited involving 14 adults (aged 26 to 60) with LD, significant concerns for emotional well-being were expressed, with many having experienced significant emotional pain. Both stress and anxiety pervaded all aspects of their lives. One participant commented that he was in a constant “heightened state of fear” (Shesell and Reiff, 1999), particularly in regard to hiding the LD, being found out or having to explain his problems.

Gregg, Hoy *et al.* (1992) compared the personality profiles of 16 university students with LD to 26 adults with LD in a rehabilitation setting. Both groups differed from the normative sample of average-achieving college students with some scores in the clinical range. For the university group, the results were interpreted to mean significant concerns for generalized anxiety disorder (i.e., fear and obsession), lack of self-confidence, self-doubt and falling short of perfectionist goals. For the LD rehabilitation sample, the authors interpreted the findings to indicate feelings of self-isolation and self-doubt. Of the supplementary scales, both groups appeared to be affected by persistent stress over the longer term, which led to higher anxiety (Gregg *et al.*, 1992).

A study that investigated personality differences between three different age groups with reading disabilities (dyslexia) showed raised levels of anxiety and apprehension as well as reduced levels of self-confidence. Interestingly, these measures fluctuated over the different age groups, with adults showing the highest representation of each of these traits. Furthermore, adults with dyslexia scored low on traits of conscientiousness and stability (Hales, 2001).

## **Depression and Suicide**

Depression is characterized by sadness, hopelessness and feelings of inadequacy. Children, youth and adults can experience depression, and those with LD are particularly vulnerable. Depression, when untreated, can lead to suicide attempts and actual suicide.

Examining the prevalence of symptoms of depression among 53 children with LD (aged 8 to 11) from both the children’s and the parents’ perspectives, researchers found that 35.85% were rated as depressed (Wright-Strawderman & Watson, 1992). They also indicated that depression was more prevalent in younger than in older children. Of the LD sample, 1 in 10 agreed with the statement, “I want to kill myself.” These results have been reflected in a recent Canadian study, which showed higher levels of loneliness, depression and problem behaviours in children with LD (Wiener, 2004).

Again referring to the National Longitudinal Study of Adolescent Health involving grades 7 to 12 (Svetaz *et al.*, 2000), the LD sample felt that they were more likely to die at a younger age and were twice as likely to report a suicide attempt in the last 12 months. In the qualitative study previously cited involving 14 adults (aged 26 to 60) with

LD, half of the participants noted depression, 10 had been treated and 4 had considered suicide. All related the depression to the presence of their LD (Shesell, Reiff, 1999). Finally, a Canadian study examined 27 adolescents who had completed suicide and had left notes. Eighty-nine per cent of the sample was found to have patterns of spelling and handwriting errors consistent to a school sample of adolescents with LD and different from a non-LD adolescent control group (McBride & Siegel, 1997).

In a review of studies of depression and suicide in LD, Bender, Rosenkrans *et al.* (1999) concluded that those with LD were more prone to suicide because of personal characteristics (e.g., impulsivity) or because of higher rates of depression. Further, they concluded that those with the non-verbal subtype of LD may be particularly susceptible to depression and suicidal risk.

### **Other Psychiatric Disorders**

Persons with LD were found to have a higher incidence of other types of disorders that affect mental health. The study described previously on SUD also found that consistent LD was associated with non-SUD psychiatric disorders such as affective disorder, anxiety disorders, schizophrenia, anorexia nervosa and bulimia (Beitchman *et al.*, 2001). A 1997 study of 152 children between the ages of 7 and 13 indicated that the somatic concerns and conduct disorders of children and adolescents with LD tended to increase with age. Additionally, children with well-developed verbal skills (i.e., scores in the average or above range on the verbal section of the Wechsler Intelligence Scale for Children) and LD were more likely to develop severe psychopathology (Tsatsanis *et al.*, 1997). Among a sample of 613 adults with specific LD served under vocational rehabilitation services during a two-year period, Dunham, Multon *et al.* (1999) found a rate of secondary psychiatric diagnoses of 29.5%, with the most common type being adjustment problems (42.0%) (Dunham *et al.*, 1999).

### **CO-EXISTING CONDITIONS, SPECIFICALLY ATTENTION DEFICIT DISORDERS**

Attention Deficit Disorder (ADD) is characterized by a short attention span (e.g., an inability to focus or sustain/shift a focus), while Attention Deficit Hyperactivity Disorder (ADHD) also comprises components of impulsivity (e.g., difficulty remaining seated, blurting out answers to questions) and under-controlled temperament (e.g., talking excessively, fidgeting constantly). A diagnosis of ADHD implies that the child, adolescent or adult is unable to respond to situational demands with age-appropriate behaviour (Silver & Hagin, 1990). In general, studies have shown that there is a high degree of co-morbidity of ADD/ADHD with LD. A study explored the connection between reading disabilities and ADHD using a sample of 494 twins with a reading disability and 373 twins without a reading disability. The ages varied between 8 and 18. The results indicated that those with reading disabilities were more likely than those without reading disabilities to manifest the symptoms of ADHD (Willcutt & Pennington,

2000). In one study, 45% of the children diagnosed with only LD or only ADHD had both disorders (Korkman & Pesonen, 1994).

A study investigating the relationship between attention and learning disabilities using 119 children (aged 8 to 16,  $m=11.1$  years) referred to a child diagnostic clinic found that 72.3% of the referrals had ADHD, while a significant number of those (70%) also had LD in reading, math, spelling and writing. Those children who had both LD and ADHD had more severe symptoms of ADHD (Mayes *et al.*, 2000). It is important to caution that this high percentage was found in a clinically referred group and is not predictive of the general population. In a Canadian study of boys aged 7 to 11, Purvis and Tannock (1997) studied language skills of three groups: ADHD, ADHD and reading disabilities, and reading disabilities. Using a story retelling task, the ADHD group were found to have problems in organizing and monitoring story retelling, whereas the reading disabilities group had more difficulties in recalling the important aspects of a story (Purvis & Tannock, 1997).

It has been proposed that what might contribute most to the overlap of these two conditions are both working memory deficits and problems in inhibition, which are considered components of executive functioning (Barkley, 1998; Denckla, 1996).

A more recent longitudinal study investigated the link between academic self-concept, ADHD and anti-social behaviours (Pisecco *et al.*, 2001). Data analyses of reading abilities, behaviour ratings and an academic self-concept scale for 443 youths indicated that difficulties in reading often result in low academic self-concept, which, in turn, contributes to the later manifestation of anti-social behaviour.

## **GENDER AND HEALTH**

Social isolation has been identified as being equally likely in males and females with LD (Al-Yagon, Mikulincer, 2004). Comparing individuals with and without LD, Svetaz, Ireland *et al.* (2000) found that males with LD were twice as likely to report more emotional stress as the non-LD group, whereas females with LD were 2.5 times more likely to report such stress. In a Canadian study (Heath & Ross, 2000), prevalence of depression was greater in girls with LD than those without LD. Girls with LD also reported higher levels of symptoms related to loss of pleasure, negative self-esteem and interpersonal problems. Boys with and without LD did not differ in rates of prevalence or in the seriousness of symptoms.

In a study of depression in children, boys and girls with LD had similar rates of depression (Wright-Strawderman & Watson, 1992). Gender differences in personality have been found in persons with reading disabilities (Hales, 2001). Tension and apprehension were found to rise over the course of development in females, but levelled off in males during adulthood. Stability, an important component of overall mental health, differed by gender over time but did not differ in adulthood. During the transition from secondary to postsecondary schooling, the level of independence dropped for females and rose for males (Hales, 2001). Some studies reported that the symptoms of



ADHD in males were more pronounced, but the actual incidence of ADHD remained approximately the same in males and females (Willcutt & Pennington, 2000).

## INDICATORS

The table below details health-related indicators of LD, including general physical health, mental health and co-existing conditions.

**Table 5: Health indicators associated with LD**

Age Group	Indicators
<b>5.2 Children and Youth</b>	5.2.1 Constant ear infections before age 5
<b>5.1 All age groups</b>	5.1.1 Social isolation (e.g., feelings of loneliness) 5.1.2 Self-reported general health, stress, anxiety and depression (e.g., misses school or work, takes medication to reduce symptoms, receives social work, psychological or psychiatric support) 5.1.3 Co-existing mental health disorders (e.g., mood, anxiety, personality, eating and sleep, substance related disorders) 5.1.4 Suicide attempts or suicide 5.1.5 Diagnosis of ADD/ADHD

## 7.0 FINANCE

It is well known that having a family member with LD or being a person with LD can result in additional financial burdens. It has been recognized as an issue in both the Health and Activity Limitation Survey and the Participation and Activity Limitation Survey. Such additional costs may be associated with education (e.g., costs of tutors, transportation, non-funded support services, books and materials, technology, longer time needed to complete programs of study, assessments necessary for postsecondary services), personal/social difficulties (e.g., cost of mentors, counsellors, non-funded support services), employment (e.g., part-time versus full-time work, reduced workloads, technological supports), family (e.g., parental/sibling need for support, parent needing to carry two jobs, parental limitations in employment due to own LD) and health (e.g., psychological assessments, costs of additional medical services, prescriptions, non-funded or partially funded counselling/therapy).

We concur with the conclusion of a report *The Economic Burden of Learning Disabilities* (included as Appendix 3), prepared by the Roeher Institute for LDAC, that “Virtually no literature has been found which directly explores the economic impacts of learning disabilities” (T. Lewis & Struthers, 2000, p. 38). We were unable to locate studies that document the nature and extent of additional costs associated with having a learning disability. However, we will continue to explore and develop appropriate financial indicators associated with LD.

### INDICATORS

No indicators were identified for this section.

## 8.0 COMPLETING THE PICTURE: SUCCESS & RESILIENCE

In the past decade, attention has begun to shift from the study of deficits associated with disability to the examination of factors that are associated with positive life outcomes. The term “resilience” has been coined to describe how some children achieve good overall outcomes as adults even though they have faced significant challenges to adaptation or development (Masten & Coatsworth, 1998). A well-recognized Canadian researcher, Bernice Wong, has targeted resilience as an important issue in the social domain of those with LD (B. Wong, 2003). As responses to her article underline, there is a need to move from a deficit model of LD in order to better address the complexity of having LD throughout the lifespan (Bryan, 2003).

To date, few research studies have examined resiliency in persons with LD. From the Kauai Longitudinal study that followed 22 children with LD from birth to their early 30s, Werner (1992) identified five groups of protective factors that contributed to successful adult adaptation, including temperamental characteristics, maximizing individual abilities and setting realistic vocational goals, care giving and education of parents, supportive adults, and positive opportunities at major life transitions. However, the scientific literature is relatively new. In examining the health of adolescents with LD using the U.S. National Longitudinal Study of Adolescent Health, Svetaz (2000) identified connectiveness to school and connectiveness to family as protective factors associated with emotional distress. As noted earlier in this review, they found adolescents with LD to be at increased risk for emotional distress and suicidal risk. The risks of emotional stress to persons with LD were significantly less in persons with LD who reported a higher sense of belonging associated both with school and with parents.

In order to paint a complete picture of the impact of LD, this project must also move beyond simply identifying deficits to identifying factors — both individually and in combination — that are associated with successful adaptation across the lifespan for persons living with a learning disability.

### INDICATORS

No indicators were identified for this section.

## 9.0 CONCLUSIONS

Despite the extent of studies explored, there remains a significant gap in our knowledge of Canadians with LD. This gap can be narrowed with the information to be garnered from the databases in Phase II of this project. The consolidation of the knowledge gained in this literature framework and the information from the databases will place Canada at the forefront of understanding who has LD, what their challenges are and which coping mechanisms they have used. In order to complete the picture, we need to know about the successes of persons with LD and how they attained those successes.

## REFERENCES

- Adelman, P., & Vogel, S. A. (1990). College graduates with learning disabilities: Employment attainment and career patterns. *Learning Disability Quarterly, 13*, 154-162.
- Al-Yagon, M. (2003). Children at-risk for learning disorders: Multiple perspectives. *Journal of Learning Disabilities, 36*(4), 318-335.
- Al-Yagon, M., & Mikulincer, M. (2004). Patterns of close relationships and socioemotional and academic adjustment among school-age children with learning disabilities. *Learning Disabilities Research & Practice, 19*(1), 12-19.
- Alston, R., Bell, T., & Hampton, J. (2002). Learning disability and career entry into the sciences: A critical analysis of attitudinal factors. *Journal of Career Development, 28*(4), 263-275.
- Anfara Jr., V. A., Brown, K. M., & Mangione, T. (2002). Qualitative analysis on stage: Making the research process more public. *Educational Researcher, 31*(7), 28-38.
- Badian, N. (1999). Reading disability defined as a discrepancy between listening and reading comprehension: A longitudinal study of stability, gender differences and prevalence. *Journal of Learning Disabilities, 32*(2), 138-148.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.
- Barkley, R. A. (1998). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). New York: Guilford Press.
- Barwick, M. A., & Siegel, L. S. (1996). Learning difficulties in adolescent clients of a shelter for runaway and homeless street youths. *Journal of Research on Adolescence, 6*(4), 649-670.
- Beitchman, J. H., Wilson, B., Douglas, L., Young, A., & Adlaf, E. (2001). Substance abuse disorders in young adults with and without ld: Predictive and concurrent relationships. *Journal of Learning Disabilities, 34*(4), 317-332.
- Bell, S. M., McCallum, R. S., & Cox, E. A. (2003). Toward a research-based assessment of dyslexia: Using cognitive measures to identify reading disabilities. *Journal of Learning Disabilities, 36*(6), 505-.
- Bender, W., Rosenkrans, C., & Crane, M. (1999). Stress, depression, and suicide among students with learning disabilities: Assessing the risk. *Learning Disability Quarterly, 22*, 143-156.
- Berninger, V. (2000). Development of language by hand and its connections with language by ear, mouth, and eye. *Topics in Language Disorders, 20*(4), 65-84.
- Berninger, V. W., Abbott, R. D., Abbott, S. P., & Graham, S. (2002). Writing and reading: Connections between language by hand and language by eye. *Journal of Learning Disabilities, 35*(1), 39-56.
- Blackorby, J., & Wagner, M. (1996). Longitudinal postschool outcomes of youth with disabilities: Findings from the national longitudinal transition study. *Exceptional Children, 62*(5), 399-412.
- Blackorby, J., & Wagner, M. (1997). The employment outcomes of youth with learning disabilities: A review of findings from the national longitudinal transition study of special education students. In.

- Blair, C., & Scott, K. (2002). Proportion of LD placements associated with low socioeconomic status: Evidence for a gradient. *Journal of Special Education*, 36(1), 14-22.
- Bohatyretz, S., & Lipps, G. (2000). Diversity in the classroom: Characteristics of elementary students receiving special education. *Education Quarterly Review*, 6(2), 7-19.
- Brooks, R. (1992). Self-esteem during the school years: Its normal development and hazardous decline. *Pediatric Clinics of North America*, 39(3), 537-550.
- Brown, M. R., Higgins, K., Pierce, T., Hong, E., & Thomas, C. (2004). Secondary students' perceptions of school life with regard to alienation: The effects of disability, gender and race. *Learning Disability Quarterly*, 26(4), 227-238.
- Bryan, T. (1989). IQ and learning disabilities: A perspective from research on social factors. *Journal of Learning Disabilities*, 22(8), 480-481.
- Buysse, V., Goldman, B. D., & Skinner, M. L. (2003). Seeing effects on friendship formation among young children with and without disabilities. *Exceptional Children*, 68(4), 503-517.
- Canadian Paediatric Society. (2002). Fetal alcohol syndrome: Position statement (ii 2002-01). *Paediatric Child Health*, 7(3), 161-174.
- Cawley, J. F., Parmar, R. S., Yan, W., & Miller, J. H. (1998). Arithmetic computation performance of students with learning disabilities: Implications for curriculum. *Learning Disabilities Research & Practice*, 13(2), 68-74.
- Citizen and Immigration Canada, Government of Canada (2003). New immigrants. *Monitor*, Spring.
- Cornwall, A., & Bawden, H. (1992). Reading disabilities and aggression: A critical review. *Journal of Learning Disabilities*, 25(5), 281-289.
- Cosden, M., Elliot, K., Noble, S., & Keleman, E. (1999). Self-understanding and self-esteem in children with learning disabilities. *Learning Disabilities Quarterly*, 22(4), 279-290.
- Cronin, M. (1996). Life skills curricula for students with learning disabilities: A review of the literature. *Journal of Learning Disabilities*, 29(1), 53-68.
- Deci, E., Hodges, R., Pierson, L., & Tomassone, J. (1992). Autonomy and competence as motivational factors in students with learning disabilities and emotional handicaps. *Journal of Learning Disabilities*, 25(7), 457-471.
- Denckla, M. B. (1996). Biological correlates of learning and attention: What is relevant to learning disability and attention-deficit hyperactivity disorder? *Developmental and Behavioral Pediatrics*, 17(2), 114-119.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (1998). *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage.
- Deslandes, R., Royer, È., Potvin, P., & Leclerc, D. (1999). Patterns of home and school partnerships for general and special education at the secondary level. *Exceptional Children*, 65(4), 496-506.
- Dickson, D. K. (2002). Shifting images of developmentally appropriate practice as seen through different lenses. *Educational Researcher*, 31(1), 26-32.
- Dickson, D. L., & Verbeek, R. (2002). Wage differentials between college graduates with and without learning disabilities. *Journal of Learning Disabilities*, 35(2), 175-184.

- Dowdy, C., Carter, J., & Smith, T. (1990). Differences in transitional needs of high school students with and without learning disabilities. *Journal of Learning Disabilities, 23*(6), 343-348.
- Dunham, M., Multon, K., & Koller, J. (1999). A comparison of adult learning disability subtypes in the vocational rehabilitation system. *Rehabilitation Psychology, 44*(3), 248-265.
- Dyson, L. L. (2003). Children with learning disabilities within the family context: A comparison with siblings in global self-concept, academic self-perception, and social competence. *Learning Disabilities: Research & Practice, 18*(1), 1-9.
- Faas, L., & D'Alonzo, B. (1990). Wais-r scores as predictors of employment success and failure among adults with learning disabilities. *Journal of Learning Disabilities, 23*(5), 311-316.
- Faas, L. A. (1990). Personality patterns of successful and unsuccessful adults with learning disabilities. *Career Development for Exceptional Individuals, 13*(1), 1-12.
- Fiedorowicz, C., Benezra, E., MacDonald, W., McElgunn, B., & Wilson, A. (2001). Neurobiological basis of learning disabilities: An update. *Learning disabilities: A Multidisciplinary Journal, 11*(2), 61-74.
- Flax, J. F., Realpe-Bonilla, T., Hirsch, L. S., Brzustowicz, L. M., Bartlett, C. W., & Tallal, P. (2003). Specific language impairment in families: Evidence for co-occurrence with reading impairments. *Journal of Speech, Language, and Hearing Research, 46*(3), 530-543.
- Fletcher, J. M., Morris, R. D., & Lyon, G. R. (2003). Classification and definition of learning disabilities: An integrative perspective. In H. L. Swanson, K. R. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 30-56). New York: Guilford.
- Fourqurean, J., Meisgeier, P., Swank, P. R., & Williams, R. (1991). Correlates of postsecondary employment outcomes for young adults with learning disabilities. *Journal of Learning Disabilities, 24*(7), 400-405.
- Fuchs, L. S., & Fuchs, D. (2002). Mathematical problem-solving profiles of students with mathematical disabilities with and without comorbid reading difficulties. *Journal of Learning Disabilities, 35*(6), 563-573.
- Fujiura, G. T., & Yamaki, K. (2000). Trends in demography of childhood poverty and disability. *Exceptional Children, 66*(2), 187-198.
- Gans, A., Kenny, M. C., & Ghany, D. L. (2003). Comparing the self-concept of students with and without learning disabilities. *Journal of Learning Disabilities, 36*(3), 287-295.
- Gerber, P. (1994). Researching adults with learning disabilities from an adult-development perspective. *Journal of Learning Disabilities, 27*(1), 6-9.
- Gerber, P., Schnieders, C., Paradise, L., Reiff, H., Ginsberg, R., & Popp, P. (1990). Persisting problems of adults with learning disabilities: Self-reported comparisons from their school-age and adult years. *Journal of Learning Disabilities, 23*(9), 570-573.
- Gerber, P. J., Ginsberg, R., & Reiff, H. B. (1992). Identifying alterable patterns in employment success for highly successful adults with learning disabilities. *Journal of Learning Disabilities, 25*, 475-487.

- Gerber, P. J., Price, L. A., Mulligan, R., & Shessel, I. (2004). Beyond transition: A comparison of the employment experiences of American and Canadian adults with LD. *Journal of Learning Disabilities, 37*(4), 283-291.
- Goldstein, D. E., Murray, C., & Edgar, E. (1998). Employment earnings and hours of high school graduates with learning disabilities through the first decade after graduation. *Learning Disabilities Research & Practice, 13*(1), 53-64.
- Graham, S. (1990). The role of production factors in learning disabled students' compositions. *Journal of Educational Psychology, 82*(4), 781-791.
- Graham, S., Harris, K. R., & MacArthur, C. (1993). Improving the writing of students with learning problems: Self-regulated strategy development. *School Psychology Review, 22*, 656-670.
- Greenbaum, B., Graham, S., & Scales, W. (1996). Adults with learning disabilities: Occupational and social status after college. *Journal of Learning Disabilities, 29*(2), 167-173.
- Gregg, N., Hoy, C., King, M., Moreland, C., & Jagota, M. (1992). The mmpi-2 profile of adults with learning disabilities in university and rehabilitation settings. *Journal of Learning Disabilities, 25*(6), 386-395.
- Gross-Tsur, V., Manor, O., & S., S. R. (1996). Developmental dyscalculia: Prevalence and demographic features. *Developmental Medicine and Child Neurology, 38*, 25-33.
- Guba, E., & Lincoln, Y. (1989). *Fourth generation evaluation*. Thousand Oaks, CA: Sage.
- Hagborg, W. (1999). Scholastic competence subgroups among high school students with learning disabilities. *Learning Disability Quarterly, 22*(1), 3-10.
- Hales, G. (2001). *The pattern of personality in dyslexic children and adults: The invisible symptoms and the effects they produce*. Paper presented at the 5th International Conference of the British Dyslexia Association, York, UK.
- Halpern, A. S. (1985). Transition: A look at the foundations. *Exceptional Children, 22*(1), 3-10.
- Haring, K., Lovett, D., & Smith, D. (1990). A follow-up study of recent special education graduates of learning disabilities programs. *Journal of Learning Disabilities, 23*(2), 108-114.
- Harlow, C. W. (2003). *Education and correctional populations*. Washington, DC: U.S. Department of Justice.
- Hartas, D., & Donahue, M. L. (1997). Conversational and social problem-solving skills in adolescents with learning disabilities. *Learning Disabilities Research & Practice, 12*(4), 213-220.
- Heath, N. L., & Ross, S. (2000). Prevalence and expression of depressive symptomatology in students with and without learning disabilities. *Learning Disability Quarterly, 23*(1), 24-36.
- Heath, N. L., & Wiener, J. (1996). Depression and nonacademic self-perceptions in children with and without learning disabilities. *Learning Disability Quarterly, 19*(1), 34-44.
- Heiman, T., & Precel, K. (2003). Students with learning disabilities in higher education: Academic strategies profile. *Journal of Learning Disabilities, 36*(3), 248-258.



- Hewitt, J., & Scardamalia, M. (1998). Design principles for distributed knowledge building processes. *Educational Psychology Review*, 10(1), 75-96.
- Houser, R., & A., C. (1993). Job satisfaction of people with disabilities placed through a project with industry. *The Journal of Rehabilitation*, 59(1), 45-49.
- Howard, K., & Tryon, G. (2002). Depressive symptoms in and type of classroom placement for adolescents with ld. *Journal of Learning Disabilities*, 35(2), 185-191.
- Jimerson, S. R. (1999). On the failure of failure: Examining the association between early grade retention and education and education and employment outcomes during late adolescence. *Journal of School Psychology*, 37(3), 243-272.
- Jimerson, S. R. (2001). Meta-analysis of grade retention research: Implications for practice in the 21st century. *School Psychology Review*, 30(3), 420-437.
- Karacostas, D., & Fisher, G. (1993). Chemical dependency in students with and without learning disabilities. *Journal of Learning Disabilities*, 26(7), 491-495.
- Karpinski, M. J., Neubert, D. A., & Graham, S. (1992). A follow-along study of postsecondary outcomes for graduates and dropouts with mild disabilities in a rural setting. *Journal of Learning Disabilities*, 25, 376-385.
- Klinger, J. K., Vaughn, S., Schumm, J. S., Cohen, P., & Forgan, J. W. (1998). Inclusion or pull-out: Which do students prefer? *Journal of Learning Disabilities*, 31(2), 148-158.
- Korkman, M., & Pesonen, A.-E. (1994). A comparison of neuropsychological test profiles of children with attention deficit-hyperactivity disorder and/or learning disorder. *Journal of Learning Disabilities*, 27(6), 383-392.
- Kortering, L., Haring, N., & Klockars, A. (1992). The identification of high-school dropouts identified as learning disabled: Evaluating the utility of a discriminant analysis function. *Exceptional Children*, 58(5), 422-435.
- Kravetz, S., Faust, M., Lipshitz, S., & Shalhav, S. (1999). Ld, interpersonal understanding, and social behavior in the classroom. *Journal of Learning Disabilities*, 32(3), 248-255.
- Lardieri, L. A., Blacher, J., & all, e. (2000). Sibling relationships and parent stress in families of children with and without learning disabilities. *Learning Disabilities Quarterly*, 23(2), 105-116.
- Leach, J. M., Scarborough, H. S., & Rescorla, L. (2003). Late-emerging reading disabilities. *Journal of Educational Psychology*, 95(2), 211-224.
- Levine, P., & Edgar, E. (1995). An analysis by gender of long-term postschool outcomes for youth with and without disabilities. *Exceptional Children*, 61(3), 282-300.
- Lewandowski, L., & Arcangelo, K. (1994). The social adjustment and self-concept of adults with learning disabilities. *Journal of Learning Disabilities*, 27(9), 598-605.
- Lewis, B. A. (1992). Pedigree analysis of children with phonology disorders. *Journal of Learning Disabilities*, 25(9), 586-597.
- Lewis, T., & Struthers, M. (2000). *The economic burden of learning disabilities and its impact on families*. Toronto, ON: The Roeher Institute.
- Liederman, J., Kantrowitz, L., & Flannery, K. (2005). Male vulnerability to reading disability is not likely to be a myth: A call for new data. *Journal of Learning Disabilities*, 38(2), 109-129.

- Lyytinen, P., Eklund, K., & Lyytinen, H. (2003). The play and language behavior of mothers with and without dyslexia and its association to their toddlers' language development. *Journal of Learning Disabilities, 36*(1), 74-.
- Maag, J. W., Irvin, D. M., Reid, R., & Vasa, S. F. (1994). Prevalence and predictors of substance use: A comparison between adolescents with and without learning disabilities. *Journal of Learning Disabilities, 27*(4), 223-234.
- Madaus, J., Foley, T., McGuire, J., & Ruban, L. (2002). Employment self-disclosure of postsecondary graduates with learning disabilities: Rates and rationales. *Journal of Learning Disabilities, 35*(4), 364-369.
- Malmgren, K., Abbott, R. D., & Hawkins, J. D. (1999). Ld and delinquency: Rethinking the 'link'. *Journal of Learning Disabilities, 32*(3), 194-200.
- Margalit, M. (2003). Resilience model among individuals with learning disabilities: Proximal and distal influences. *Learning Disabilities Research and Practice, 18*(2), 82-86.
- Marsh, H. W., & Hattie, J. (1996). Theoretical perspectives on the structure of self-concept. In B. A. Bracken (Ed.), *Handbook of self-concept: Developmental, social and clinical considerations* (pp. 38-90). New York: Wiley.
- Martin, E. W. (1993). Learning disabilities and public policy: Myths and outcomes. In G. R. Lyon, D. B. Gray, J. F. Kavanagh & N. A. Krasnegor (Eds.), *Better understanding learning disabilities: New views from research and their implications for education and public policies* (pp. 325-342). Toronto: Paul H. Brookes.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist, 53*(2), 205-220.
- Mayes, S. D., Calhoun, S. L., & Crowell, E. W. (2000). Learning disabilities and ADHD: Overlapping spectrum disorders. *Journal of Learning Disabilities, 33*(5), 417-424.
- McAfee, J., & McNaughton, D. (1997). Transitional outcomes-- job satisfaction of workers with disabilities, part one: General job satisfaction. *Journal of Vocational Rehabilitation, 8*, 135-142.
- McArthur, G., & Bishop, D. (2001). Auditory perceptual processing in people with reading and oral language impairments: Current issues and recommendations. *Dyslexia, 7*, 150-170.
- McBride, H., & Siegel, L. S. (1997). Learning disabilities and adolescent suicide. *Journal of Learning Disabilities, 30*(6), 652-659.
- McCoy, A. R., & Reynolds, A. (1999). Grade retention and school performance: An extended investigation. *Journal of School Psychology, 37*(2), 273-298.
- McNulty, M. (2003). Dyslexia and the life course. *Journal of Learning Disabilities, 36*(4), 363-381.
- Meltzer, L., Roditi, B., Houser Jr., R. F., & Perlman, M. (1995). Perceptions of academic strategies and competence in students with learning disabilities. *Journal of Learning Disabilities, 31*(5), 437-451.
- Miller, R., Snider, B., & Rzonca, C. (1990). Variables related to the decision of high school students with and without learning disabilities. *Journal of Learning Disabilities, 23*(6), 349-354.

- Molfese, D. L., Molfese, V. J., Key, S., Modgline, A., & al, e. (2002). Reading and cognitive abilities: Longitudinal studies of brain and behavior changes in young children. *Annals of Dyslexia*, 52, 99-.
- Molfese, V. J., Molfese, D. L., & Modgline, A. (2001). Newborn and preschool predictors of second-grade reading scores: An evaluation of categorical and continuous scores. *Journal of Learning Disabilities*, 34(6), 545-554.
- Nagaoka, J., & Roderick, M. (2004). *Ending social promotion: The effects of retention*. Chicago, Ill: Consortium on Chicago School Research at the University of Chicago.
- National Association of School Psychologists. (2003). Position statement on student grade retention and social promotion.
- National Reading Panel. (1999). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implication for reading instruction*. Washington, DC.
- Nowicki, E. (2003). A meta-analysis of the social competence of children with learning disabilities compared to classmates of low and average to high achievement. *Learning Disability Quarterly*, 26(3), 171-188.
- Park, J., Turnbull, A. P., & Turnbull III, H. R. (2002). Impacts of poverty on quality of life in families of children with disabilities. *Exceptional Children*, 68(2), 151-170.
- Pascual-Leone, & Johnson, J. (2004). Affect, self-motivation, and cognitive development: A dialectical constructivist view. In D. Y. Dai & R. J. Sternberg (Eds.), *Motivation, emotion, and cognition: Integrative perspectives on intellectual functioning and development* (pp. 197-235). Mahwah, NJ: Erlbaum.
- Patton, J., & Polloway, E. (1992). Learning disabilities: The challenges of adulthood. *Journal of Learning Disabilities*, 25(7), 410-415, 447.
- Pavri, S., & Monda-Amaya, L. (2001). Social support in inclusive schools: Student and teacher perspectives. *Exceptional Children*, 67(3), 391-411.
- Pintrich, P. R., Anderman, E. M., & Klobucar, C. (1994). Intraindividual differences in motivation and cognition in students with and without learning disabilities. *Journal of Learning Disabilities*, 27(6), 360-370.
- Pisecco, S., Wristers, K., Swank, P. R., Silva, P., & Baker, D. B. (2001). The effects of academic self-concept on ADHD and antisocial behaviors in early adolescence. *Journal of Learning Disabilities*, 34(5), 450-461.
- Poon-McBrayeer, K. F., & Garcia, S. B. (2000). Profiles of Asian American students with ld at initial referral, assessment, and placement in special education. *Journal of Learning Disabilities*, 33(1), 61-70.
- Purvis, R. L., & Tannock, R. (1997). Language abilities in children with attention deficit hyperactivity disorder, reading disabilities, and normal controls. *Journal of Abnormal Psychology*, 25, 133-144.
- Ransby, M., & Swanson, H. L. (2003). Reading comprehension skills of young adults with childhood diagnoses of dyslexia. *Journal of Learning Disabilities*, 36(6), 538-555.
- Raskind, M. H., Goldberg, R. J., Higgins, E. L., & Herman, K. L. (1999). Patterns of change and predictors of success in individuals with learning disabilities: Results from a twenty-year longitudinal study. *Learning Disabilities Research and Practice*, 14(1), 35-49.

- Reid, D. K. (1991). Learning disorders: Theoretical and research perspectives. In D. K. Reid, W. R. Hresko & H. L. Swanson (Eds.), *A cognitive approach to learning disabilities* (pp. 103-127). Austin, TX: Pro-Ed.
- Reis, S., Neu, T., & McGuire, J. (1997). Case studies of high-ability students with learning disabilities who have achieved. *Exceptional Children*, 63(4), 463-479.
- Reisman, E., & Reisman, J. (1993). Supervision of employees with moderate special needs. *Journal of Learning Disabilities*, 26(3), 199-206.
- Rhodes, S., & Raskinski, D. (1990). Learning disabilities in alcohol-dependent adults: A preliminary study. *Journal of Learning Disabilities*, 23(9), 551-556.
- Roberts, R., & Mather, N. (1997). Orthographic dyslexia: The neglected subtype. *Learning Disabilities Practice*, 12(4), 236-250.
- Rogan, L. L., & Hartman, L. D. (1990). Adult outcome of learning disabled students ten years after initial follow-up. *Learning Disabilities Focus*, 5(2), 91-102.
- Rojewski, J. W. (1999). Occupational and educational aspirations and attainment of young adults with and without ld 2 years after high school completion. *Journal of Learning Disabilities*, 32(6), 533-552.
- Rourke, B., & Conway, J. A. (1997). Disabilities of arithmetic and mathematical reasoning: Perspectives from neurology and neuropsychology. *Journal of Learning Disabilities*, 30(1), 34-46.
- Samuelsson, S., & Lundberg, I. (2003). The impact of environmental factors on components of reading and dyslexia. *Annals of Dyslexia*, 53, 201-.
- Schoenbrodt, L., Kumin, L., & Sloan, J. (1997). Learning disabilities existing concomitantly with communication disorder. *Journal of Learning Disabilities*, 30(3), 264-281.
- Shafir, U., & Siegel, L. (1994). Subtypes of learning disabilities in adolescents and adults. *Journal of Learning Disabilities*, 27(2), 123-134.
- Shalev, R. S., Manor, O., Kerem, B., Ayali, M., Badichi, N., Friedlander, Y., et al. (2001). Developmental dyscalculia is a familial learning disability. *Journal of Learning Disabilities*, 34(1), 39-65.
- Shapiro, E. S., & Lentz, F. E. J. (1991). Vocational technical programs: Follow-up students with learning disabilities. *Exceptional Children*, 58(1), 47-59.
- Share, D. L., & Silva, P. A. (2003). Gender bias in IQ-discrepancy and post-discrepancy definitions of reading disability. *Journal of Learning Disabilities*, 36(1), 4-14.
- Shesell, I., & Reiff, H. (1999). Experiences of adults with learning disabilities: Positive and negative impacts and outcomes. *Learning Disabilities Quarterly*, 22, 305-316.
- Siegel, L. (2003). Basic cognitive processes and reading disabilities. In H. L. Swanson, K. R. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 158-181). New York: Guilford.
- Siegel, S., & Gaylord-Ross, R. (1991). Factors associated with employment success among youths with learning disabilities. *Journal of Learning Disabilities*, 24(1), 40-47.
- Silver, A., & Hagin, R. (1990). *Disorders of learning in childhood*. Toronto: John Wiley & Sons.

- Singer, B. D., & Bashir, A. S. (November 1999). *Authentic assessment of writing: Approaches that inform instruction and intervention*. Paper presented at the American Speech-Language Hearing Association Convention, San Francisco, CA.
- Statistics Division, Office of Policy and Planning, (August 2002). *Legal immigration, fiscal year, 2001* (No. Annual Report No. 7): U.S. Department of Justice: Immigration and Naturalization Service.
- Stilington, P., Frank, A., & Carson, R. (1992). Adult adjustment among high school graduates with mild disabilities. *Exceptional Children*, 59(3), 221-233.
- Stone, C. A., & May, A. L. (2002). The accuracy of academic self-evaluations in adolescents with learning disabilities. *Journal of Learning Disabilities*, 35(4), 370-383.
- Svenson, I., Lundberg, I., & Jacobson, C. (2003). The nature of reading difficulties among inmates in juvenile institutions. *Reading and Writing: An Interdisciplinary Journal*, 16(7), 667-691.
- Svetaz, M., Ireland, M., & Blum, R. (2000). Adolescents with learning disabilities: Risk and protective factors associated with emotional wellbeing: Findings from the national longitudinal study of adolescent health. *Journal of Adolescent Health*, 27, 340-348.
- Swanson, H. L., & Sáez, L. (2003). Memory difficulties in children and adults with learning disabilities. In H. L. Swanson, K. R. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 182-198). New York: Guilford.
- Taylor, K., & Walter, J. (2003). Occupation choices of adults with and without symptoms of dyslexia. *Dyslexia*, 9, 177-185.
- Théorêt, M., & Hrimech, M. (1999). Les paradoxes de l'abandon scolaire: Trajectoires de filles et de garçons du secondaire. *Canadian Journal of Education*, 24(3), 251-279.
- Tsatsanis, K., Fuerst, D., & Rourke, B. (1997). Psychosocial dimensions of learning disabilities: External validation and relationship with age and academic functioning. *Journal of Learning Disabilities*, 30(5), 490-502.
- Tur-Kaspa, H., Weisel, A., & Segev, L. (1998). Attributions for feelings of loneliness of students with learning disabilities. *Learning Disabilities Research and Practice*, 13(2), 89-94.
- Vallance, D., & Wintre, M. (1997). Discourse processes underlying social competence in children with language learning disabilities. *Development and Psychopathology*, 9, 95-108.
- Vogel, S. A., & Adelman, P. (1990). Extrinsic and intrinsic factors in graduation and academic failure among 1d college students. *Annals of Dyslexia*, 40, 119-137.
- Vogel, S. A., & Adelman, P. (1992). The success of college students with learning disabilities: Factors related to educational attainment. *Journal of Learning Disabilities*, 25(7), 430-441.
- Vogel, S. A., & Adelman, P. (2003). Adults with learning disabilities 8-15 years after college. *Learning Disabilities*, 10(3), 165-182.
- Vogel, S. A., & Forness, S. (1992). Social functioning in adults with learning disabilities. *School Psychology Review*, 21(3), 375-386.

- Vogel, S. A., Hruby, P., & Adelman, P. (1993). Educational and psychological factors in successful and unsuccessful college students with learning disabilities. *Learning Disabilities Research & Practice*, 8(1), 35-43.
- Wagner, M., Cadwallader, T., Garza, N., & Cameto, R. (2004). *Social activities of youth with disabilities; nlts2 data brief*. Menlo Park, CA: Office of Special Education Programs, U. S. Department of Education.
- Wagner, M., Cadwallader, T., Marder, C., Cameto, R., Cardoso, D., Garza, N., *et al.* (2003a). *Life outside the classroom for youth with disabilities; executive summary*. Menlo Park, CA: Office of Special Education Programs, U. S. Department of Education.
- Wagner, M., Marder, C., Levine, P., Cameto, R., Cadwallader, T., Blackorby, J., *et al.* (2003b). *The individual and household characteristics of youth with disabilities; a report from the national longitudinal transition study-2 (nlts2) executive summary* (No. SRI Project P11182). Menlo Park, CA: Office of Special Education Programs, U. S. Department of Education.
- Wagner, M., Newman, L., & al., e. (2004). *Changes over time in the secondary school experiences of students with disabilities*. Menlo Park, CA: Office of Special Education Programs U. S. Department of Education.
- Wagner, R. K., & Torgeson, J. K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. *Psychological Bulletin*, 101(2), 192-212.
- Waldie, K., & Spreen, O. (1993). The relationship between learning disabilities and persisting delinquency. *Journal of Learning Disabilities*, 26(6), 417-432.
- Waldron, N. L., & McLesky, J. (1998). The effects of an inclusive school program on students with mild and severe learning disabilities. *Exceptional Children*, 64(3), 395-405.
- Wehmeyer, M. L., & Schwartz, M. (1997). Self-determination and positive adult outcomes: A follow-up study of youth with mental retardation or learning disabilities. *Exceptional Children*, 63(2), 245-255.
- Weinberg, N. Z. (2001). Risk factors for adolescents substance abuse. *Journal of Learning Disabilities*, 34(4), 343-351.
- Wenz-Gross, M., & Siperstein, G. (1998). Students with learning problems at risk in middle school: Stress, social support and adjustment. *Exceptional Children*, 65(1), 91-100.
- Werner, E. E. (1990). Protective factors and individual resilience. In S. J. Meisels & J. P. Shonkoof (Eds.), *Handbook of early childhood intervention* (pp. 97-116). Cambridge, UK: Cambridge University Press.
- White, W. (1992). The postschool adjustment of persons with learning disabilities: Current status and future projections. *Journal of Learning Disabilities*, 25(7), 448-456.
- Wiener, J. (2004). Do peer relationships foster behavioral adjustment in children with learning disabilities. *Learning Disabilities Quarterly*, 27(1), 21-30.
- Wiener, J., & Siegel, L. (1992). A Canadian perspective on learning disabilities. *Journal of Learning Disabilities*, 25(6), 340-350, 371.

- Wiener, J., & Sunohara, G. (1998). Parents' perceptions of the quality of friendship of their children with learning disabilities. *Learning Disabilities Research and Practice, 13*(4), 242-257.
- Wigfield, A., Eccles, J. S., & Rodriguez, D. (1998). The development of children's motivation in school contexts. In P. D. Pearson & A. Iran-Nejad (Eds.), *Review of research in education* (pp. 73-118). Washington, DC: American Educational Research Association.
- Willcutt, E. G., & Pennington, B. F. (2000). Comorbidity of reading disability and attention-deficit/hyperactivity disorder: Differences by gender and subtype. *Journal of Learning Disabilities, 33*(2), 179-191.
- Wilson, A. M., & Lesaux, N. K. (2001). Persistence of phonological processing deficits in college students with dyslexia who have age-appropriate reading skills. *Journal of Learning Disabilities, 34*(5), 394-.
- Witte, R., Philips, L., & Kakela, M. (1998). Job satisfaction of college graduates with learning disabilities. *Journal of Learning Disabilities, 31*(3), 259-265.
- Wolf, M. (1991). The word-retrieval deficit hypothesis and developmental dyslexia. *Learning and Individual Differences, 3*(3), 205-223.
- Wong, B. (2003). General and specific issues for researchers' consideration in applying the risk and resilience framework to the social domain of learning disabilities. *Learning Disabilities Research and Practice, 18*(2), 68-76.
- Wong, B. Y. L. (1997). Research on genre-specific strategies for enhancing writing in adolescents with learning disabilities. *Learning Disability Quarterly, 20*, 140-159.
- Wong, B. Y. L., Harris, K. R., Graham, S., & Butler, D. (2003). Cognitive strategies instruction research in learning disabilities. In H. L. Swanson, K. R. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 383-402). New York: Guilford.
- Wood, F. B., & Grigorenko, E. L. (2001). Emerging issues in the genetics of dyslexia: A methodological preview. *Journal of Learning Disabilities, 34*(6), 503-511.
- Wright-Strawderman, C., & Watson, B. (1992). The prevalence of depressive symptoms in children with learning disabilities. *Journal of Learning Disabilities, 25*(4), 258-264.
- Yin, R. (1994). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.
- Ylvisaker, M., DeBonis, D., & Nippold, M. A. (2000). Executive function impairment in adolescence. *Topics in Language Disorders, 20*(2), 29-57.
- Zera, D. A. (2001). A reconceptualization of learning disabilities via a self-organizing systems paradigm. *Journal of Learning Disabilities, 34*(1), 79-94.
- Zigmond, N. (2003). Searching for the most effective service delivery model for students with learning disabilities. In H. L. Swanson, K. R. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 110-122). New York: Guilford.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64-70.