Patterns of school readiness among selected subgroups of Canadian children: Children with special needs and children with diverse language backgrounds

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Executive Summary

School readiness is usually understood as a child's ability to take advantage of the educational opportunities offered by the school environment. It is a holistic concept including several developmental areas: physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication skills and general knowledge. The Early Development Instrument (EDI) is a Canadian checklist tool measuring children's school readiness in all these five areas. Teachers complete the checklist for each child in their classroom when children are in the second half of their kindergarten year. The EDI also includes information on children's characteristics like gender, their first language, or special education needs. Since 2000, standardized data on children's readiness to learn at school have been collected for over half a million children in many communities in Canada with the EDI.

This project had been designed in response to community-level requests for empirical data on special and small populations. The current document reports school readiness patterns among 5-year-old Canadian children belonging to two types of important, yet low-frequency populations: children with special needs and children from diverse language backgrounds - those for whom the language of instruction is not their first language. The majority of analyses in this report come from the most recent three-year cycle of data (from 2004/5 to 2006-7), called the Normative II database, which contains data for over 160,000 children from most regions in Canada.

EDI scores for all five domains are calculated based on the Normative II database. These are provided for all children, as well as for boys and girls separately. These values are often used by communities to establish baselines for comparisons with their own community EDI data. Small groups, like children with special educational needs, and children with a first language other than French or English (diverse language backgrounds) are often too small at a local level to achieve adequate representation for examination of school readiness. In this report, we examined patterns of school readiness in those small groups in comparison with children who do not have special needs, and those who have English or French as their first and only language. As well as providing results to communities, we expect that our findings will inform policy decisions at many levels and provide the direction for early interventions.

For the purpose of this report, not only general patterns of school readiness against a control group were examined, but also even smaller groups with more detailed characteristics were identified, and their school readiness outcomes in five domains of the EDI examined. When the results are described, each of the groups is placed in a context based on recent data on Canadians as provided mostly by Statistics Canada, gathered through Census every five years.

Children with special needs represented 3.8% of the population in the Normative II database. Boys outnumbered girls. As a rule, children with special needs had consistently low EDI scores in all domains, and the differences between them and the controls were of large magnitude. The domain of Communication Skills and General Knowledge showed the largest magnitude of difference. There were also, however, disparities among groups in relation to the type of needs: for example, students with visual and hearing impairments, while functioning below their control group peers, did not fare as poorly as those children having other types of problems.

Children with diverse language background were those whose first language was neither English nor French. They were further classified into those who were 1) not fluent in the language of instruction (English or French, depending on the school board's language) – thus having only one, non-official language, and classified as Second Language Learners (SLL), and 2) bilingual – those that had English or French as well as another language and were not classified as English as a Second Language or French as a Second Language Learners. We also created a language-control group with children who were monolingual in the language of instruction. Twelve language groupings were identified as numerous enough in the Normative II database to allow for detailed analyses. Punjabi, Spanish, and Cantonese were the three most frequent, reflecting the overall Canadian population data. The SLL group of children had consistently lower outcomes than the bilingual or language-control groups. For some of the language groups, however, the strong differences were only shown in the language and communication areas.

Some groups of bilingual children had better outcomes than the language-control group. The extent of this finding varied in terms of the developmental areas and the magnitude of difference. The most common pattern was that bilingual children did better than the controls in the physical development, social and sometimes emotional development, did as well in language, and tended to do slightly worse in the communication areas.

The findings, on the whole, confirmed the expectations formed on smaller samples. With the large-scale population data, we were able to show that the two groups of interest, even though they are often considered as a whole, have a considerable diversity that can only be untangled with such data as provided by the EDI. The striking differences in school readiness within language groups in relation to the children's fluency in the language of instruction are a very clear indication that more effort has to be directed toward language support for families with young children.

Placed within the appropriate context, these results can guide practical intervention and prevention strategies at school and before, as well as provide broad-based background for more detailed, in depth investigations of specific populations.

Background

Concept of school readiness

The shape of school trajectories is often established early in a child's school career (Jimerson, Egeland, & Teo, 1999; Entwisle & Alexander, 1999; Ramey & Ramey, 2004). Thus, the first years are critical for setting children on a trajectory of success – a course which pays out future dividends in the areas of later educational attainment and adult health (Zuckerman & Halfon, 2003). In order to develop optimally in this context, a child needs to be able to profit by the social and academic environment which the school affords (Janus & Offord, 2000). In other words, a child needs to be ready to learn at school. According to Forget-Dubois, et al. (2007, p. 406), school readiness is a "multidimensional construct that refers to the cognitive, communicational, behavioral, and emotional skills, as well as basic knowledge that facilitate the child's learning and adjustment at school entry." It includes both cognitive and non-cognitive factors, hard and soft skills, general knowledge and approaches to learning, academic and socio-emotional components (Janus & Duku, 2007). Readiness is a process which develops over the preschool years, is influenced by the school context and is an outcome of the child's progress to date (Meisels, 1999). The challenge then for child development researchers investigating diversity issues in the context of school readiness is to have a tool which is adequate to measure the multiple domains of development and to have access to substantive numbers in low-frequency, heterogeneous groups. The current body of literature is reflective of the difficulty of this task. For example, in LaParo and Pianta's (2000) meta-analytic review of more than seventy longitudinal studies measuring several domains of school readiness on subsequent primary school performance, the researched populations were small in number (typically no more than a few hundred children), relied heavily on individual testing or screening measures, and consisted

primarily of Caucasians, with limited representation of children from differing ethnic, cultural and economic backgrounds.

School readiness should be understood as a holistic concept involving several developmental areas such as cognitive, socio-emotional and physical (Meisels, 1999; Jimerson et al., 1999). Competence in all these areas will ensure that children are ready to benefit from educational activities offered in the school environment (Janus & Offord, 2000). In 1998-1999, a new instrument was developed at McMaster University to capture this holistic concept in the measurement of school readiness. The Early Development Instrument (EDI) is a teacher-completed checklist, containing just over 100 core items grouped into five developmental domains (Janus & Offord, 2007). For the purpose of the monitoring function, school readiness is conceptualized in the EDI as a proxy for a holistic view of outcomes of the child's early years, within the context of family and neighbourhood. Therefore, at a population level, it is intended to capture the status of children's early development in the context of that child's community.

Since its inception, use of the EDI has proliferated in regions across Canada and internationally. Its large database provides ample opportunities for comparison studies and, in combination with community mapping projects, for research into societal factors affecting children's physical, emotional and intellectual growth. Based on EDI results, community leaders can determine patterns of skills and deficits or vulnerabilities that supersede differences in family circumstances and reflect the larger environment affecting children.

Diversity in a classroom

Diversity characterizes the Canadian classroom. With the increasing commitment in our classes to inclusion of students with exceptionalities, and with a shifting demographic driven by

new immigration patterns, schools and communities are encountering both new challenges and opportunities. Indeed, the face of our student population is changing.

It is to be expected that the state of children's school readiness might be affected by these changes in the make-up of the classroom. In Canada, school education is under provincial jurisdiction. The provincial Ministries of Education throughout the country have established policies and protocols addressing needs of individual children (e.g. Janus, Lefort, Cameron & Kopechanski, 2007). For example, children who have difficulties in comprehending the classroom language are offered English (or French) as a Second Language classes, while children with special educational needs undergo an assessment process supervised by a special committee (in Ontario, for example, the Identification, Placement, and Review Committee) intended to determine what specific resources and adjustments might be called for in the classroom.

While these policies often work for individuals, there is currently no overall, country-level information on the status of school readiness among children from diverse populations that might be useful for a broadly-based approach, which addresses these needs before children enter school. One of the difficulties in creating such information is that these subpopulations are often both heterogeneous and numerically small. In the face of this, often the greatest challenge is to gather data which are representative of these subpopulations of interest. These groups might include, for example, children who belong to low-frequency categories, such as those with various minority languages and those with a variety of special needs. Although local data may reflect the demographics of a particular community fairly, small numbers do not allow for adequate analyses of vulnerability and strength patterns. Small numbers are insufficient for

developing a solid foundation for either program implementation or policy recommendation. Small numbers capture pixels of the overall picture.

Research questions and the databases

The research questions addressed in this report can be summarized as follows:

1) Are patterns of school readiness different for children with special needs than for typically-developing children? Are these differences systematic with respect to specific problems or conditions?

2) Are patterns of school readiness different for children with diverse language background than for children whose first language is the language of the classroom? Are these differences systematic with respect to specific language? Are these differences consistent regardless of a child's fluency in the classroom language?

The Offord Centre at McMaster University houses an extensive national database on the developmental status of Canadian kindergarten children. This database is used to investigate the research questions. In many communities in Canada standardized data on children's readiness to learn at school have been collected over the past six years with the Early Development Instrument (EDI). The EDI provides kindergarten outcome measures in the domains of Physical Health and Well-being, Social Competence, Emotional Maturity, Language and Cognitive Development, and Communication and General Knowledge [1](Janus & Offord, 2007). Four of these could be further subdivided into subdomains. In total, there are 16 subdomains. Table 1 outlines the domains, subdomains, and gives examples of the items.

[1] More details on the domains are provided in the Methods section

Table 1 Domains, subdomains, and sample questions on the EDI

EDI Domains	Subdomains	Example items
Physical Health and Well-being	Physical readiness for school day	arrives at school hungry
	Physical independence	has well-coordinated movements
	Gross and fine motor skills	is able to manipulate objects
Social Competence	Overall social competence	is able to get along with other children
	Responsibility and respect	accepts responsibility for actions
	Approaches to learning	works independently
	Readiness to explore new things	is eager to explore new items
Emotional Maturity	Prosocial and helping behaviour	helps other children in distress
	Anxious and fearful behaviour	appears unhappy or sad
	Aggressive behaviour	gets into physical fights
	Hyperactivity and inattention	is restless
Language and Cognitive Development	Basic literacy	is able to write own name
	Interest in literacy/numeracy, and uses memory	is interested in games involving numbers
	Advanced literacy	is able to read sentences
	Basic numeracy	is able to count to 20
Communication Skills and General Knowledge	(No subdomains)	is able to clearly communicate one's own needs and understand others shows interest in general knowledge about the world

These domains and their variations have been widely recognized as fundamental components of developmental health (Love & Raikes, 2004) and are significant factors for later school success (; Doherty, 1997; Keating, 2007). Federal governments in both Canada and the United States have commissioned reports addressing children's school readiness and both

identify these functional capacities. In Canada the components of school readiness have been outlined in Zero to Six: The Basis for School Readiness (Doherty, 1997), and in the United States in Goal One of the National Education Goals (Kagan, Moore & Bredekamp, 1995; Shepard, Kagan & Wurtz, 1998).

The Early Development Instrument is a psychometrically sound tool which is adequate to measure the requisite multiple domains of development. And, due to the scope of its implementation in Canada over the past decade, the EDI database is impressive in both number and geographic scale. A representative national sample of over 116,000 kindergarten children during the years from 2000 to 2004 was collected. A second sample followed thereafter covering the period 2005 to 2007, including over 176,000 children. In addition to these normative gold standard samples were groups of children with identified special needs, numbering over 3000 and 7000 respectively. Thus the EDI has the rigour to measure children's developmental health on a wide scale, and the capacity to provide substantive numbers of low-frequency, heterogeneous groups such as linguistically diverse children and those with special needs.

The analysis of children's school readiness in this report is driven by the belief that these are the outcomes of their earliest experiences fostered through relationships within the family, community and school settings. While measuring children's competencies in various domains of functioning, the EDI at its core most truly reflects an interactionist and developmental systems approach. This recognizes the embeddedness of children in multiple social systems as they negotiate their external world as agents and recipients (Mashburn & Pianta, 2006). Since child development is fairly open and fluid during these formative years, early intervention programs

may favourably impact multiple domains of school competencies (Barnett, Young, & Schweinhart, 1998).

Measures

The Early Development Instrument

The Early Development Instrument (EDI) is a teacher-completed 104-question checklist measuring children's readiness to learn at school before entry to Grade 1 in five domains. The EDI was developed by Dan Offord and Magdalena Janus at the Offord Centre for Child Studies, McMaster University in 1998, and finalised in 2000 (Janus & Offord, 2007).

The Physical Health and Well-being domain refers to children's physical preparedness for the school day, fine and gross motor skills, energy level throughout the day, and physical independence. The Social Competence domain covers the following areas: competence and cooperation in working together with others, ability to remember and follow rules, curiosity and eagerness, approaches to learning and problem-solving. The Emotional Maturity domain covers prosocial behaviour, aggression, inattention and hyperactivity, and anxious behaviours. The domain of Language and Cognitive Development refers to the child's ability to use language correctly and covers cognitive aspects of language and numeracy, in several areas: basic literacy and numeracy skills, interest and memory, and more complex literacy. The Communication Skills and General Knowledge domain covers the child's ability to clearly communicate one's own needs and thoughts in a way that is understandable to both adults and other children, the ability to understand others, clear articulation, as well as aspects of general knowledge. In

contrast to the previous domain, this one is about effective communication regardless of the grammatical correctness[2].

The EDI is completed by teachers in the second half of the kindergarten year, usually over a period of 2-3 weeks between February and March. Thus, all children are at the same grade level, but since the age of entry to kindergarten is based on the child's birthday by December of the preceding year, in any given classroom the variation in age can be as large as one year (i.e., between children born in January and December).

The currently accepted definition of school readiness encompasses all areas of child development: socio-emotional, cognitive, approaches to learning, and physical well-being. However, there are few instruments available to provide an opportunity to assess a child along all these dimensions in a feasible and economical format. From that point of view, the existing EDI database of Canadian children offers unparalleled advantage of exploring empirical levels of children's readiness to learn at school. First, the instrument covers the relevant developmental areas. Second, due to its implementation for whole populations of children, the database includes data for all children in the community, and not only a sample of them. Thirdly, on account of such wide-scale implementation, it allows aggregation of information for populations of children with specific characteristics, who otherwise may contribute only very few scores to community-level data. For instance, in the majority of communities there are subgroups of children with specific characteristics, such as special needs or minority languages, who often constitute less than five percent of the whole kindergarten community.

The EDI is completed by primary education teachers who receive board-wide instruction in the tool. This provides consistent region by region and year over year reporting. It also

[2] More information on the EDI, its implementation in Canada, results, and bibliography, can be found at www.offordcentre.com/readiness.

prevents differing interpretations and misunderstandings of questions, language challenges, uneven educational and literacy backgrounds and the low return rates of parent-completed questionnaires.

Procedure

The Normative Databases

Since 1999 EDI data has been collected for over 520,000 4-5 year old children in Canada and more than ten other countries. Normative data on the EDI domains are based on a community-representative subgroup of the current database collected in Canada over the years 1999/2000 to 2003/2004 for Normative I, and 2004/2005 to 2006/2007 for Normative II (Janus & Duku, 2004; 2008). All ten Canadian provinces participated in the first normative database. The second normative database, while significantly larger in number, comprised data from seven of the provinces. The three smaller missing Maritime provinces have just recently completed another EDI implementation in their scheduled rollout.

A small modification in coding of eighteen items was introduced in 2004 based on outcomes of psychometric analysis (Janus & Offord, 2007). While overall these modifications did not cause any substantive changes, it is a standard practice with the EDI data to consider databases collected prior to 2004 separately from those collected after. We include the overall results for both databases; however, for clarity of presentation the detailed analyses are presented only for the more recent database, Normative II.

Several criteria in terms of data quality had to be applied in order to identify the subgroup for the normative, "gold standard", sample. First, only children attending the Senior Kindergarten year (entry at 5 years of age) were included. Second, for communities that

participated more than once over the respective data collection period the fullest or the most recent implementation was included in that normative database. The next step in ensuring the reliability of data was to restrict the sample by excluding the following: 1) missing or out of appropriate range age, 2) missing gender, and 3) missing two or more domains. Children with special needs status (or missing this information) were filtered out of this normative sample. This resulted in the final sample of 116,860 children for Normative I, and 176,621 for Normative II. This represents 88.4% and 91.7% respectively of the initial samples. Children with identified special needs comprised a group numbering 3061 over the years 2000 to 2004 and 7089 from 2005 to 2007.

There are a number of subpopulations that could be identified within such a large and comprehensive database as the EDI, due to the demographic data collected concurrently. They are listed below.

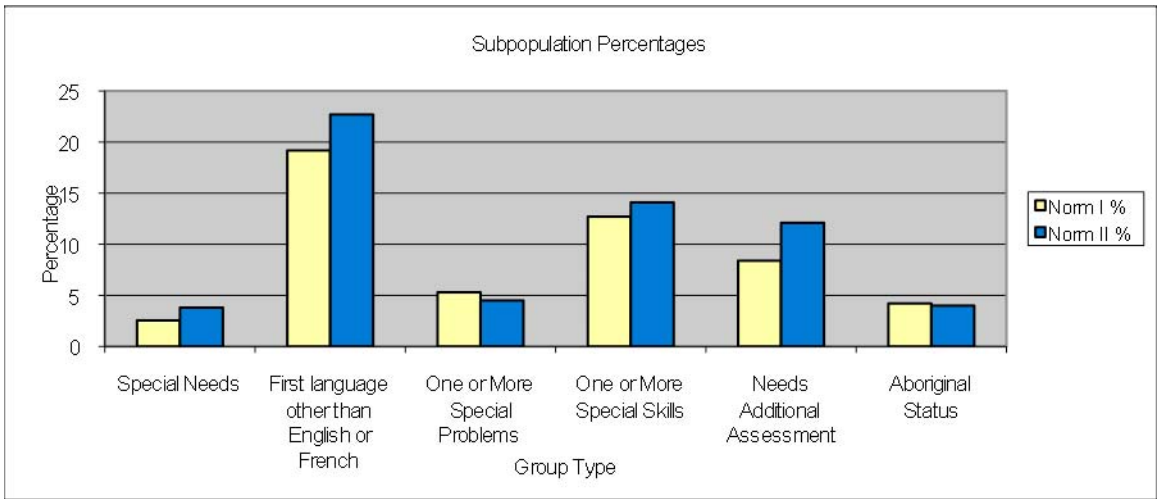
- children with special needs: children reported on the first page of the EDI as "having Special Needs", based on school board special education classification procedures. Note: this is the only subpopulation that is routinely excluded from normative databases due to the fact that it includes children that are likely not developing typically. Their data are not included in community-level school (or neighbourhood) reports.
- children with first language other than English (in Anglophone schools) or French (in Francophone schools): children reported by teachers as having a different language than the language of instruction; they are termed Second Language Learners; including those reported as bilingual, and those reported as monolingual in a language other than English or French,

- children with special problems: these are children for whom teachers endorse a statement "child has a problem that influences his/her ability to do school work in a regular classroom" (Question D1 on the EDI), based on parent information. Note: these are endorsed for children who do not have "Special Needs" as well as for those that do. They are separated in analyses.
- children with special skills: these are children for whom teachers endorse one or more of the special skills listed in Section B,
- children who require additional assessment: these are children for whom teachers endorse a statement "child requires a further assessment" (Question D3 on the EDI) Note: these are endorsed for children who do not have "Special Needs" as well as for those that do. They are separated in analyses.
- children with Aboriginal status: these are children for whom teachers endorse a statement "child has Aboriginal status".

The percentages of each of these subgroups in both Normative databases are on Figure 1.

In this report, we focus on the first two of these crucial, yet not very numerous, subpopulations: children with special needs and children with first language other than English or French (language of instruction). Our goal was to establish levels of EDI-measured school readiness within subgroups and to compare these to established levels for children outside these populations; that is, a control group of children with none of the six subgroup characteristics. The control groups consisted of children with no special needs, monolingual in the language of instruction, no special problems, no special skills, no need for further assessment, and no Aboriginal status. These control groups consisted of 84,393 children for Normative I, and 127,559 for the Normative II period.

Figure 1 Percentages of children comprising various subpopulations in the normative databases



Subpopulation of Children with Special Needs

According to the 2006 Statistics Canada Participation and Activity Limitation Survey (PALS), the percentage of 5 to 9 year old Canadian children with disabilities is 4.2%, representing some 74,580 individuals (Statistics Canada, 2008a). The gender breakdown for this age group is 5.3% boys and 3.0% girls.

Table 2 Composite results of PALS for childhood disabilities

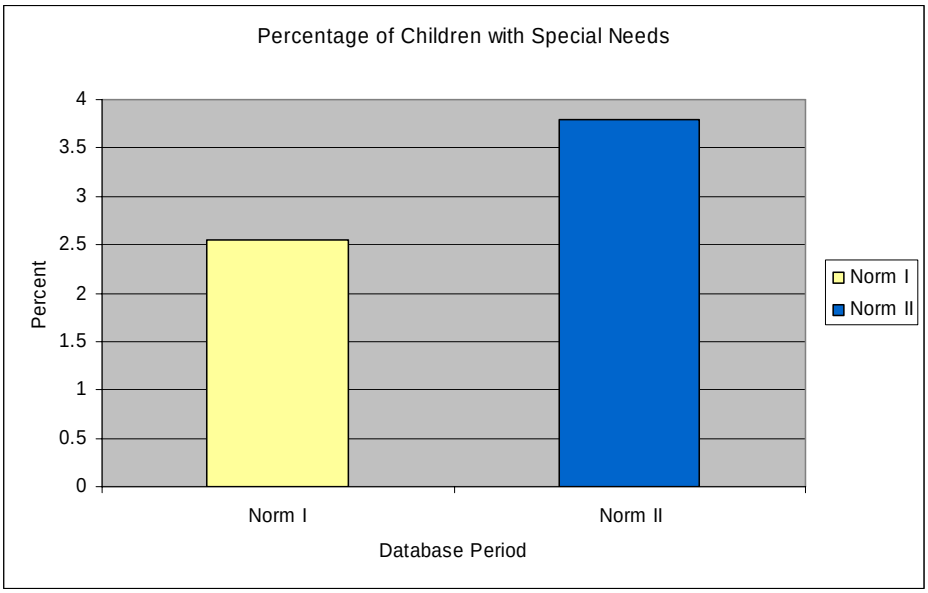
Age in Years	2001 Total Population	Disabilities #	Disabilities %	Boys %	Girls %	2006 Total Population	Disabilities #	Disabilities %	Boys %	Girls %
0 -14	5,546,020	180,930	3.3	4.0	2.5	5,471,360	202,350	3.7	4.6	2.7
0-4	1,641,680	26,210	1.6	1.9	1.3	1,656,040	27,540	1.7	2.1	1.2
5-14	3,904,330	154,720	4.0	4.9	3.0	3,815,310	174,810	4.6	5.7	3.4
5-9	1,914,220	70,370	3.7	4.6	2.7	NA	74,580	4.2	5.3	3.0
10-14	1,990,110	84,350	4.2	5.1	3.3	NA	100,230	4.9	6.0	3.7

Sources: Statistics Canada, 2002a,b, 2008a

From the compilation of the Statistics Canada data, it is evident that the overall rate of disabilities increases with age. For example, in 2006 only 1.7% of Canadian preschool children (age 0 to 4) have disabilities. This rate increases to 4.6% for elementary school children (ages 5 through 14) (Statistics Canada, 2008b). In large measure this reflects the time taken for some disabilities to become apparent, to be diagnosed, or to occur. PALS recognizes that some types of disabilities are not identified before age five. For example, learning and psychological disabilities are not specified for the preschool group in the PALS survey. As well, the process of identification itself takes time to unfold. Additionally, disease and accidents over the course of years contribute to the rates. The EDI Normative II kindergarten rate of 3.8% is a reasonable reflection of the overall PALS rate of 4.2% for children ages 5 to 9 given that the disability rate rises with age. The EDI is capturing a particular transition year between the preschool and school-aged groups.

The percentage of children with special needs as a component of the total population grew between the two normative datasets (Figure 2). Both the PALS survey and the EDI have shown increasing rates of disabilities among Canadian children over the last decade. In 2001, the disability rate for Canadian children aged 5 to 9 according to PALS was 3.7% (Statistics Canada, 2002a), growing to 4.2% by 2006 (Statistics Canada, 2008a). The EDI rate reflects this pattern increasing from 2.55% to 3.8%. Of particular note is that while disability rates are rising, overall school enrollment numbers are marginally declining. This has important implications for both the health care and educational systems.

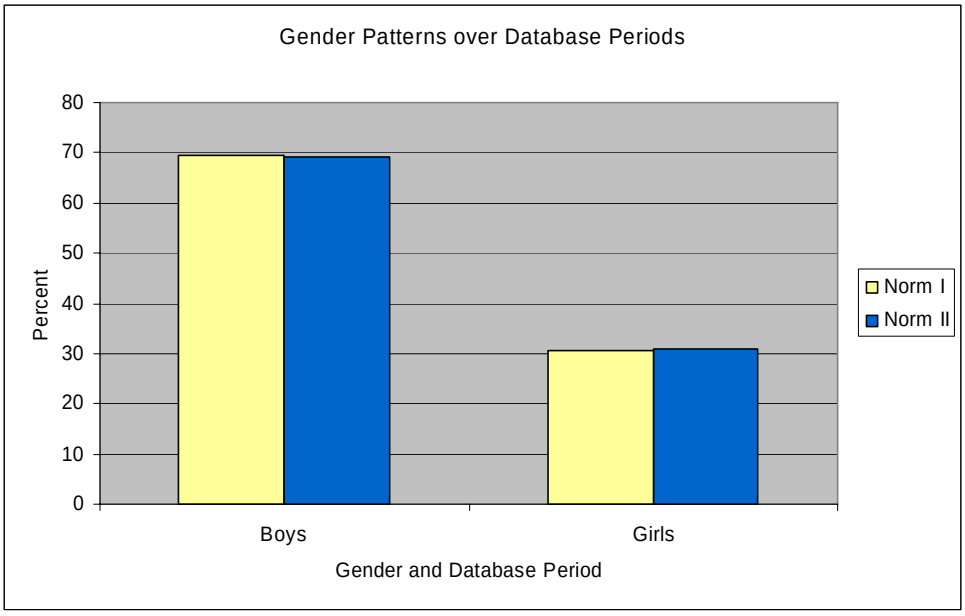
Figure 2 Percentage of children with special needs in the two databases



Boys significantly outnumber girls in the population with special needs. The EDI reflects a rate of approximately 70% boys to 30% girls, a differential which is consistent over both sets of data periods (Figure 3). The rates of boys with special needs, as well as boys who have one or more special problems, or boys who need further assessment are strikingly higher than the girls'

rates. Regarding special needs, boys have more biological health problems than girls, and are more likely to have developmental delays, intellectual disabilities and behavioural disorders (Gissler, Järvelin, Louhiala, & Hemminki, 1999). Consequently they make up the majority of the children in special educational programmes.

Figure 3 Gender patterns in subpopulation of children with special needs in the two databases



Because the EDI is a developmental measure, it taps the various domains of functioning. Physical Health and Well-Being, Social Competence, Emotional Maturity, Language and Cognitive Development, and Communication Skills and General Knowledge are each scored on a 10 point scale. These domains are not mutually exclusive: some combinations such as physical health and emotional maturity have weak correlations (0.42) while social competence and emotional maturity show strong interrelationships (0.77).

In order to provide a consistent method of group comparison, independent of the sample size, effect sizes for each of the five EDI domains were calculated in the following way: $\frac{mean(attribute) - mean(control)}{s.d.(control)}$. Since it is independent of the measurement or sample size, effect size of a difference between two groups is the best indicator of how meaningful this difference is. It is customary to interpret the effect sizes of 0 to 0.3 as small, 0.3 to 0.8 as moderate, and greater than 0.8 as large. An effect size of 0.8 means that 79% of the comparison group is higher than the control group. An effect size of 1.6 indicates that 95% of the comparison group is higher. Negative effect sizes mean the comparison group is lower than the control group.

Children with identified special needs function significantly below the control group of children in all domains. The EDI means in the group with special needs were statistically significantly lower than those in the control group (Table 3).

Table 3 EDI Domain means, standard deviation and effect sizes for the difference between children with Special Needs and Control group in the Normative II database

Domain	Special Needs			Control			Effect Size
	N	Mean	SD	N	Mean	SD	
Physical Health and Well-Being	7072	6.85	2.03	100820	8.77	1.26	-1.52
Social Competence	7070	5.39	2.52	101028	8.33	1.73	-1.70
Emotional Maturity	7006	5.93	1.94	100238	8.06	1.45	-1.47
Language and Cognitive Development	7043	5.65	2.97	100620	8.45	1.68	-1.67
Communication Skills and General Knowledge	7077	3.82	3.08	101010	7.86	2.31	-1.75

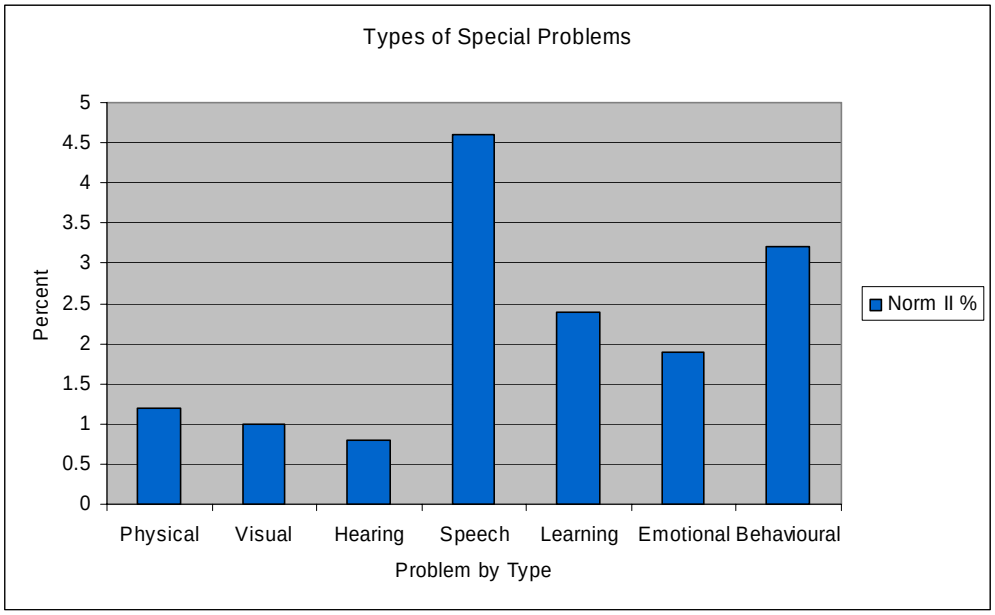
The widest divergence was in the communication skills and general knowledge domain. This domain taps the child's ability to effectively communicate thoughts and needs to both adults and children, to understand others' communication, to articulate clearly, and to answer general knowledge questions (Janus & Offord, 2007). On the face of it, this domain may seem to be particularly impacted by the high rates of children with speech and language problems. Within both the EDI results and PALS 2006, speech problems figure prominently among the rates of childhood disabilities. For instance, PALS reports that 45% of elementary school aged children with disabilities have speech problems.

For children with special needs all effect sizes for the five EDI domains in the Normative II database were large (-1.71 to -2.1). These were all significant when controlling for age and gender. Children with special needs are as a group negatively impacted in all areas of functioning. This, however, should not be surprising. It is difficult to think of a condition that would be limited to only a few areas of functioning. For example, a physical impairment may have implications for one's ability to engage socially with peers or to possess sufficient motor skills for school work. A behavioural problem will invariably impact one's social interactions as well as one's self-regulation in areas such as impulse control and focusing attentional processes.

The EDI also allows for a more nuanced consideration of difficulties which children may experience. We further examined various disabilities in relation to the control group (Figure 4), as recorded in Section D of the EDI. These included the following seven categories: physical disabilities, visual, hearing and speech impairments, learning disabilities, emotional and behavioural problems. All children for whom any of these disabilities were endorsed, were considered, regardless whether the child was classified by the school board as requiring special education or not. Over four percent of children (4.5%) fell into the category of having one or

more special problems. Even though the impairments are not mutually exclusive: (for example, a child may have both a speech and hearing problem or emotional and behavioural difficulties), each of these disabilities was compared against the control group.

Figure 4 Percentages of various special problems in the Normative II database



Several features stand out in the descriptive analysis. Speech problems, as noted above, are by far the greatest problem type. As well, the mean age of children with special problems in each of these conditions is above that of the control group. Children with physical and learning disabilities were almost a month older on average than their control counterparts (mean of 5.79 years compared with 5.70 years of age). The other categories of impairment showed approximately a half month age increase. This may reflect the desire on the part of some parents to register their children later, or the school's recommendation to hold some children back or follow a combination of half day kindergarten/half day grade 1. Finally in all problem areas, the

communication skills and general knowledge domain seemed to be the one most affected. While the control group had a mean of 8.13, the specific impairments had a range of 3.33 (learning disabilities) and 3.78 (speech impairment) to a high of 6.12 (visual impairment). It must be remembered though that a child may have co-morbidities across problem areas. Finally, and not surprisingly, children with emotional or behavioural problems scored low on the social and emotional domains.

Effect sizes were large in all domains in all non-sensory problem areas (i.e., physical disability, speech and learning impairments, emotional and behavioural problems, see Table 4). These had a range of -1.05 to -2.87 (i.e. 84 – 99% of control children scored better). Thus in all domains, in all these problems areas, children were functioning one to several standard deviations below their control group peers. And, it must be remembered that this group encompasses more than just children with diagnosed special needs. Many of these students will find themselves struggling in multiple domains without the benefit of formal recognition by the school board, possibly hampering their ability to access valuable resources.

Table 4 Effect sizes of differences in comparison of groups with specific problems with the control group

	Physical Disability	**Visual Impairment**	**Hearing Impairment**	**Speech Impairment**	**Learning Disability**	**Emotional Problem**	**Behaviour Problem**
Physical Health & Well-Being	-2.13	-1.05	-0.78	-1.34	-1.96	-1.62	-1.42
Social Competence	-1.47	-0.88	-0.85	-1.30	-2.19	-2.38	-2.57
Emotional Maturity	-1.12	-0.69	-0.65	-1.05	-1.73	-2.44	-2.58
Language & Cognitive Development	-1.75	-1.04	-0.97	-1.76	-2.87	-1.63	-1.63
Communication & General Knowledge	-1.57	-0.95	-1.24	-2.05	-2.26	-1.49	-1.37

Students with visual and hearing impairments, while functioning below their control group peers, did not fare as poorly as those children having other types of problems. While most domain effect sizes were large, effect sizes for emotional maturity were only moderate and for hearing impairment moderate in the physical health and well-being domain (i.e., less than 0.8). All effect sizes were significant when controlling for age and gender.

In conclusion, children with special educational needs and with problems affecting their ability to learn at school are disadvantaged in all five domains of development in comparison to their typically-developing peers. However, our analyses indicate that these children do not constitute a uniform group, and much can be learned by examining the patterns of their school readiness among categories of impairment. Since the frequencies of these impairments are generally low, databases such as the EDI one, collected on a population level, can be particularly helpful.

Subpopulation of Children with Diverse Language Backgrounds

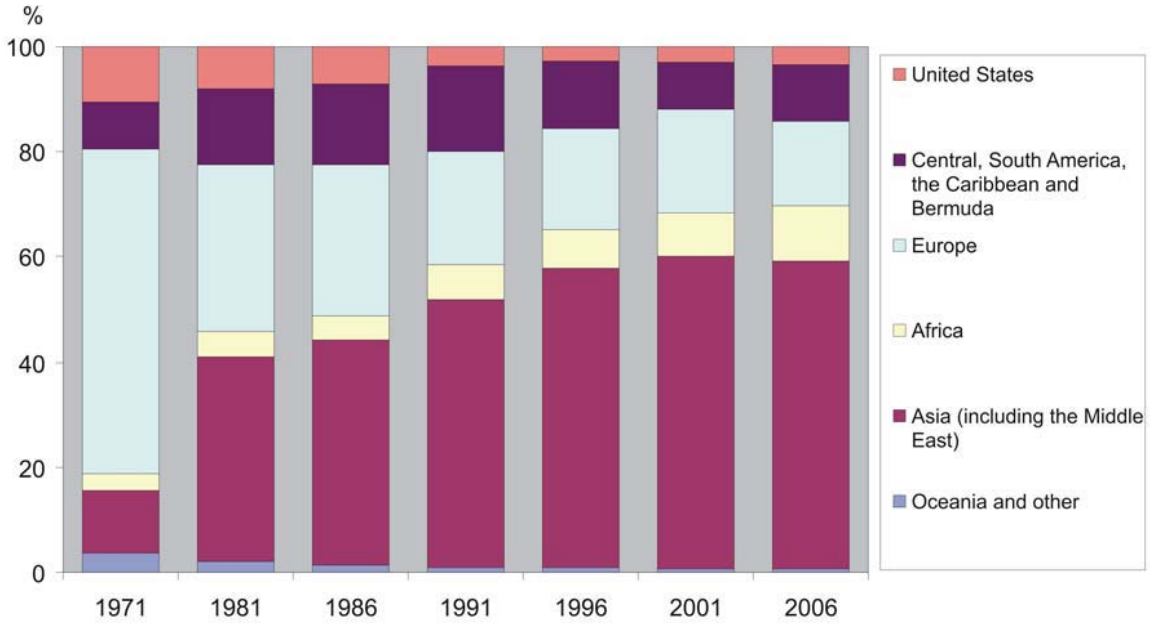
Immigration patterns and demographics

Canada has historically been a country of immigrants. As of the 2006 Canadian census, the following demographics now characterize our population (Chui, Tran & Maheux, 2007). The foreign-born population now accounts for 19.8% of our total populace, reaching the highest proportion in 75 years. These individuals have come from over 200 countries and speak almost 150 different languages. In the five years between the last census enumerations (2001-2006),

over a million people have made their way to Canada, accounting for two-thirds of our population growth during those years. Of these newcomers, one in five is under the age of 14.

Historically, most immigrants to Canada have been of European origin. For example in 1971, Europeans accounted for just over 60% of new immigrants. Beginning in the 1980s though, people from Asia and the Middle East began to arrive in substantial numbers. As of the 2006 census, the proportion of those from Asia (including the Middle East) had surpassed that of European-born. Of the million-plus newcomers who had arrived in Canada in the period from 2001 to 2006, 58% of them were from Asia. China, India, the Philippines and Pakistan topped the list for country of origin. In total, these four comprised almost 38% of all recent immigrants. Notably, recent arrivals from Europe accounted for only 16%, while those from Central and South America and the Caribbean accounted for approximately a further 11%, with the African continent just marginally lower. Figures 5 and 6, based on Census outcomes charts from the Immigration in Canada, 2001 and 2006 Census reports, illustrate the changing immigration patterns in Canada over the last thirty years.

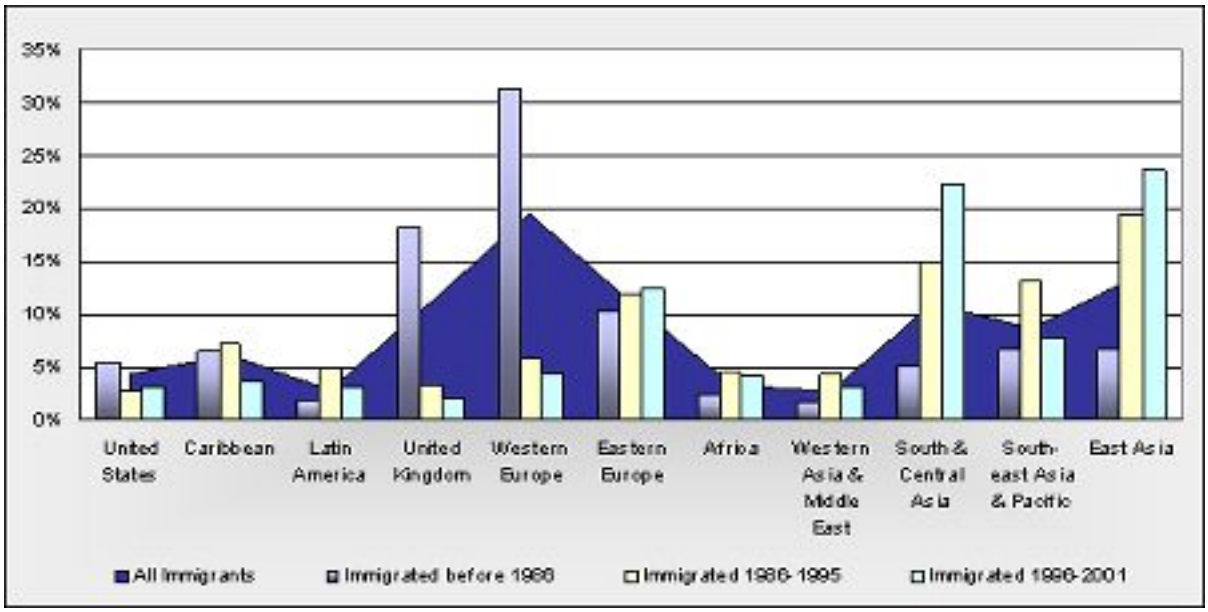
Figure 5 Region of birth of recent immigrants to Canada, 1971 to 2006



Notes:
1. 'Recent immigrants' refers to landed immigrants who arrived in Canada within five years prior to a given census.
2. "Other" includes Greenland, St Pierre and Miquelon, the category 'other country', as well as a small number of immigrants born in Canada.

Sources: Statistics Canada, censuses of population, 1971 to 2006; Chui, Tran & Maheux (2007).

Figure 6 Immigrants by period of immigration—world regions of birth, Canada, 2001 (percentage distribution)

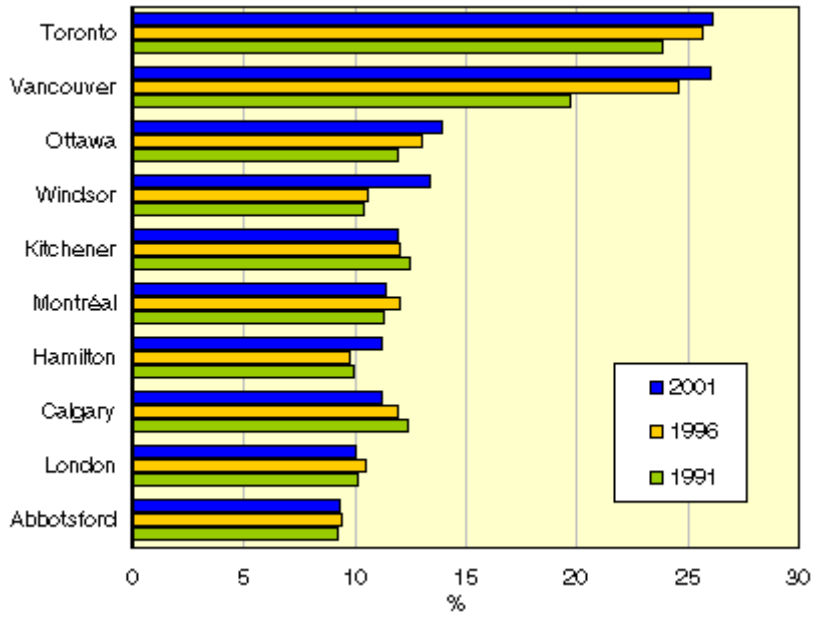


Source: Citizenship & Immigration (2005)

Due to the increasing diversity of sending countries, Canada's language landscape has become correspondingly diverse (Statistics Canada, 2007a). For the first time, fully 20% of the Canadian population reports a mother tongue which is neither English nor French (Statistics Canada, 2007b). This record setting rate is in large measure driven by recent immigration patterns in which four out of five people who now come to Canada are Allophones – those whose mother tongue is neither of Canada's official languages (Statistics Canada, 2007a). Nevertheless, most of the recent immigrants stated that they were able to converse in either English or French (Chui, Tran & Maheux, 2007).

Overall, the top ten non-official languages within Canada are, in order: Chinese languages, Italian, German, Punjabi, Spanish, Arabic, Tagalog, Portuguese, Polish, and Urdu (Statistics Canada, 2007a). However, in the intercensal period of 2001 to 2006, the languages from Asian/Middle Eastern and Latin American regions recorded the largest gains. These included Chinese, Punjabi, Arabic, Urdu, Tagalog, Tamil and Spanish. One out of eight Canadians speaks a non-official language most often at home (Statistics Canada, 2007a,b). The following figure illustrates the extent to which Canadian cities are facing substantial percentages of immigrant children among their school-aged population.

Figure 7 Proportion of immigrants among the school-age population (ages 5-24), selected census metropolitan areas, 1991, 1996, 2001



Source: Statistics Canada (2004)

Definitions of language groups for EDI data analyses

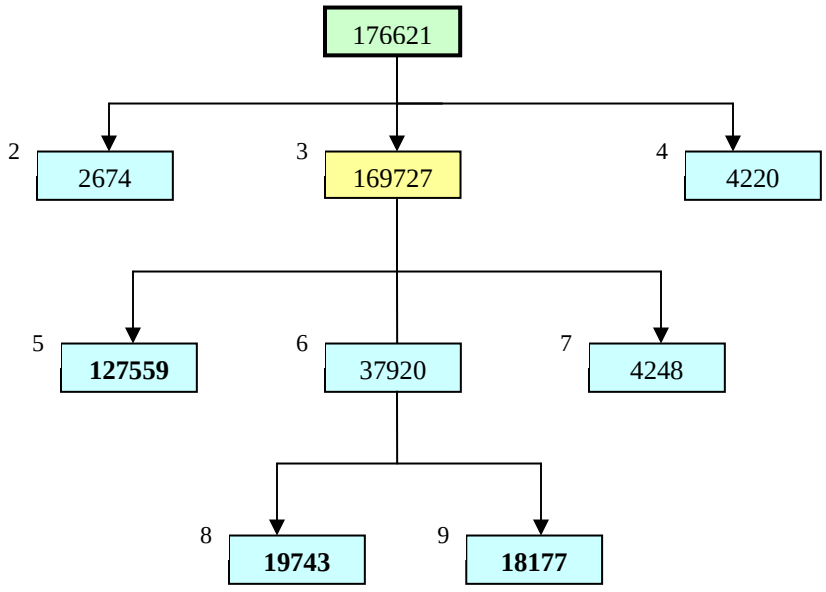
Language information on the EDI has been collected since the 1999/2000 school year. On the first page of the EDI, Question 12 asks about the child's first language, giving the teacher seven answer options: English only, French only, Other only, English and French, English and Other, French and Other, and Other and Other ("Other" is always accompanied with a space for specifying the language).

Children in Anglophone school boards with English only as the first language, and children in Francophone school boards with French only as the first language were combined to form a "Language-control" group. Children in any answer where "Other" language was listed were combined to form a "Diverse-language" category. The only group entirely omitted from the analyses in this report consisted of children who were reported to have both English and

French as the first language. (Children with special needs do not form part of the normative samples and were not included in any language analysis).

Question 8 on the first page of the EDI requests the teacher to record whether the child is classified as having English as a Second Language (in Anglophone school boards) or French as a Second Language (in Francophone School Boards). Children in the "diverse-language" category AND endorsed as having the language of instruction as the second language are defined as "Second Language Learners" (SLL) for the purpose of analyses. Children in the "diverse-language" category AND NOT endorsed as having the language of instruction as the second language are defined as "Non-Second Language Learners" (non-SLL or "Bilingual" (BIL) (Figure 8).

Figure 8 Selection of the samples from the database (Normative II).



1: Total population
2: Bilingual in English and French
3: Sample with excluded bilingual and missing First Language variable
4: Missing First Language variable
5: Language-controls (French only & English only)
6: EFSL classification valid (Yes or No)
7: Missing EFSL status variable
8: EFSL=Yes (SLL)
9: EFSL=No (Not SLL=Bilingual)

Table 5 Frequencies of Language-control, and Diverse-language groups

	Normative I		**Normative II**	
	N=113,642		N=169,727	
	N	%	N	%
Language-control	84393	74.3	127,559	75.2
Diverse-language	23,800	20.9	37,920	22.3
SLL	13,044	11.5	19,743	11.6
Bilingual	10,756	9.5	18,177	10.7
Missing EFSL classification	5,449	4.8	4,248	2.5

Therefore, the following comparisons will be analyzed in this section of the report: first, the Language-control (box 5) with Diverse-language group as a whole (boxes 8 & 9); second, the Language-control with Second Language Learners (box 8), and Bilingual groups (box 9) separately.

EDI outcomes

As can be seen from Table 5, there was a small increase over time in the frequency of kindergarten children coming from diverse language background (20.9% to 22.3%). The group of bilingual children who are fluent in the school's prevailing language of instruction and therefore are not considered to require school language supports has grown slightly, from 9.5% to 10.7%. As the proportion of Second Language Learner group remained relatively steady, this may be due to the sharp drop in the percentage of children with diverse language for whom the English/French learner status was not specified (from almost 5% to 2.5%). While it is possible

that teachers became more accurate in their reporting, it could, however, also suggest a greater accuracy in identifying children who need SLL supports. While the increased rates identified by the EDI reflect only kindergarten children, they are indicative of greater numbers of children who are spread throughout the school system. As noted earlier, 20% of newcomers to Canada are children of elementary school and preschool age.

Group comparisons

When Diverse-language group was compared with Language-controls, there were only trivial effect sizes on four of the five domains (Table 6). Only in the Communication Skills and General Knowledge domain there was a moderate effect size (-0.63) However, most mean scores were higher among the Language-controls.

Table 6 Comparison of Diverse-language and Language-control groups: Domain scores, standard deviations (SD), and effect sizes

	Diverse-language			**Language-control**			**Effect Size**
Domain	N	Mean	SD	N	Mean	SD	
Physical Health and Well-Being	37804	8.79	1.28	127276	8.78	1.31	0.001
Social Competence	37906	8.21	1.81	127525	8.35	1.78	-0.08
Emotional Maturity	37566	8.01	1.42	126600	8.06	1.51	-0.03
Language & Cognitive Development	37738	8.23	1.91	127034	8.53	1.73	-0.17
Communication Skills & General Knowledge	37880	6.55	2.93	127503	8.00	2.32	-0.63

Further, Second Language Learners scored lower than Language-controls in all EDI domains (Table 7). The effect size of the difference was moderate for the Language and Cognitive Development Domain (-0.39), but large for the Communication Skills one (-1.09).

Table 7 Comparison of Second Language Learner and Language-control groups: Domain scores, standard deviations (SD), and effect sizes.

	Second Language Learners			Language-control			Effect Size
	N	Mean	SD	N	Mean	SD	
Physical Health and Well-Being	19686	8.62	1.35	127276	8.78	1.31	-0.12
Social Competence	19731	7.96	1.89	127525	8.35	1.78	-0.22
Emotional Maturity	19509	7.84	1.45	126600	8.06	1.51	-0.15
Language and Cognitive Development	19626	7.85	2.06	127034	8.53	1.73	-0.39
Communication Skills and General Knowledge	19723	5.47	2.93	127503	8.00	2.32	-1.09

Bilingual children, as a whole, had slightly higher, but largely similar scores as the Language-controls (Table 8). Effect sizes clearly indicate that there were no meaningful differences in the scores between these two groups.

Table 8 Comparison of Bilingual and Language-control groups: Domain scores, standard deviations (SD), and effect sizes

Domain	Bilingual			Language-control			Effect Size
	N	Mean	SD	N	Mean	SD	
Physical Health and Well-Being	18118	8.97	1.18	127276	8.78	1.31	0.15
Social Competence	18175	8.48	1.68	127525	8.35	1.78	0.07
Emotional Maturity	18057	8.18	1.37	126600	8.06	1.51	0.08
Language and Cognitive Development	18112	8.65	1.63	127034	8.53	1.73	0.07
Communication Skills and General Knowledge	18157	7.71	2.44	127503	8.00	2.32	-0.13

The difference in magnitude between the two language-oriented domains when exploring the SLL children's outcomes (Table 7) is likely a result of the conceptual underpinnings of each of them. The Language and Cognitive Development domain on the EDI is intended to cover areas of literacy and numeracy, and the basic use of the language of instruction in a correct manner. A child who came to school with limited understanding of the language, can still benefit from classroom reading activities, can learn letters and numbers, and demonstrate memory skills or time concepts. Such children will likely be able to express themselves with less fluency than a child with full command of the language, but if these Language Learners are normally developing, besides this one disadvantage, there is a potential for these children to catch up. In contrast, the Communication Skills and General Knowledge domain covers areas of functional knowledge of the language of instruction and the reality of the surroundings. This domain reflects a child's ability to act using language in ways that require quick reaction to

spoken commands and full comprehension of phrases. Moreover, this domain reflects the amount of exposure the child would have had to the language of instruction and its culture prior to school entry. It is therefore not surprising that the magnitude of a gap between the Language Learners and children fluent in the language of instruction will be bigger in the Communication Skills and General Knowledge domain than in the Language and Cognitive Development domain.

There were no particular gender differences in percentages of bilingual or SLL children. All comparisons between the control group and the bilingual and SLL children remained significant when controlling for age and gender.

Specific language groups

Since 2001/2 school year, the EDI has asked teachers to specify the child's first language(s). The EDI-identified top languages are virtually identical to those indicated by the Statistics Canada reports. The EDI indicates that Punjabi, Spanish, Cantonese, Arabic, Filipino/Tagalog, Mandarin, Urdu, Vietnamese, Tamil, Portuguese, Italian and Polish were the most frequent non-official mother tongue[3].

Both normative EDI periods reflect the same most frequent twelve languages. These languages represent 7.7% (2001/2 to 2003/4) and 10.3% (2004/5 to 2006/7) of the entire EDI populations for those years (8,781 and 17,428 respectively). These group sizes had a range of 312 to 2140 children in the earlier collection period and 663 to 3929 in the latter time. These top twelve groups represent a mix of both Second Language Learners (SLL) and bilingual (BIL)

[3] Only German, which was on the Statistics Canada list, was not among the top EDI languages. Statistics Canada information includes the child and adult population and thus reflects immigration patterns over longer periods.

speakers. The percentages with which these dozen languages occurred vary somewhat over the two databases.

From the EDI databases, we selected children with these twelve most frequent mother tongues. To enable more detailed comparisons, we used the cut-off of at least 0.4% of the sample in the Normative II database,[4] as these analyses were only carried out for this database.

Table 9 Frequency of the twelve top languages in each Normative database

2001/2-2003/4		**2004/5-2006/7**	
Language	Percent	Language	Percent
Punjabi	1.9%	Punjabi	2.3%
Cantonese	0.8%	Cantonese	1.3%
Spanish	0.7%	Spanish	1.0%
Urdu	0.7%	Urdu	0.7%
Filipino/Tagalog	0.6%	Filipino/Tagalog	1.0%
Vietnamese	0.6%	Vietnamese	0.6%
Arabic	0.6%	Arabic	0.9%
Polish	0.5%	Polish	0.4%
Portuguese	0.4%	Portuguese	0.4%
Tamil	0.4%	Tamil	0.4%
Mandarin	0.3%	Mandarin	0.8%
Italian	0.3%	Italian	0.4%

Punjabi, Spanish, Arabic, Filipino/Tagalog and Mandarin showed the greatest percentage increase. This reflects the large gains in immigration from Asia and Latin America as described in a Statistics Canada report (2007a). In particular China, India, the Philippines and Pakistan were the greatest source countries for immigration. By language, Spanish ranked second in terms of rate of growth.

[4] The Mandarin and Italian language groups constituted only 0.3% in Normative I, but were retained for consistency.

These language groups are not mutually exclusive since there may be some situations in which children were taught from infancy both Portuguese and Spanish, or Cantonese and Mandarin, for example. Furthermore, each language represents a mixed group of mono-, bilingual or even multilingual children: the criterion for inclusion being their first language(s) assignation in a top twelve language group. Within each group, children were further classified as Second Language Learners or Bilingual.

From this point, each of the twelve groups was compared directly with the Language-control group defined earlier. Statistically significant differences ($p<0.05$) were noted in all of the domains and in most of the languages when compared with the controls. In most cases, the Language-controls had higher EDI scores than the Diverse-language comparison groups as a whole. For six out of the 12 specific groups, the Language-control group always had better scores than the Diverse-language group: Punjabi, Spanish, Arabic, Urdu, Vietnamese, and Portuguese. However, once the Diverse-language groups were split into Second Language Learners and Bilingual groups (see Table 9 for frequencies), the Bilingual group in almost any language had the highest scores, with the exception of Language and Cognitive, and Communication Skills domains.

Table 10 Proportions of SLL and Bilingual students in each of the 12 diverse language groups in each database

	Normative I		Normative II	
Language	Second Language Learners	Bilingual	Second Language Learners	Bilingual
	%	%	%	%
Punjabi	67.9	32.1	75.5	24.5
Cantonese	57.1	42.9	71.2	28.8
Spanish	44.1	55.9	34.4	65.6
Urdu	62.7	37.3	65.7	34.3
Filipino/Tagalog	40.4	59.6	42.5	57.5
Vietnamese	63.2	36.8	72.6	27.4
Arabic	51.5	48.5	45.3	54.7
Polish	37.2	62.8	38.0	62.0
Portuguese	25.2	74.8	13.5	86.5
Tamil	53.7	46.3	49.4	50.6
Mandarin	56.3	34.7	73.3	26.7
Italian	8.8	91.2	4.4	95.6

The variance between the language groups appears to reflect the bigger historical picture. The group's historical migration pattern is likely to have influenced the balance of the mono- and bilingual proportions within any language. Differences between groups in their migration history provide for the varied pattern evident in Table 10. For example, whereas the European waves of immigration occurred during the course of the 20th century, the greatest proportions happened pre-1970 (see Figure 5). The EDI data indicate that most of the children in the Italian, Portuguese and Polish groups are bilingual. Italian is the most marked of these groups with only seven to nine percent being SLL. The remaining more than ninety percent have exposure to both English and Italian in their early years. This is indicative of a migration timeframe in which the parents of these kindergarten children, themselves either immigrants or children of immigrants, continue to pass on the heritage language. Spanish and Filipino/Tagalog languages are more

evenly divided between bilingual and monolingual speakers. Although the Philippines is a recent and significant source country for immigration, Filipinos enjoy the benefit of English being the national language of commerce and the language of instruction in most preschools and schools. Thus a large number of parents and children have functional knowledge of English upon arrival in Canada (personal communication, March, 2009). Explanations are not as readily apparent for Spanish, but factors such as length of time spent in the United States (either as a source country or en route to Canada) or the SES of the immigrant population which may correlate with access to English educational instruction may play into these language balances. More recently arrived groups (i.e., those from Asia such as China, India and Pakistan) have the highest rates of SLL children, with percentages typically around 70%.

Most consistency was observed in the Communication and General Knowledge domain, in which the Control group scored significantly better in eleven out of the twelve groups in both time periods. The only exception were children speaking Italian, a group with relatively low frequency and also with low SLL percentage, for whom there was either no difference or a better score compared with the control group.

All differences noted above remained significant when controlling for age and gender.

To summarize, developmental outcomes among groups of non-official language speakers vary across domains. Along with their language, immigrants bring cultural beliefs, values and practices. These ways of thinking, relating and behaving may have a protective effect on children's developmental physical health and well-being outcomes, which may positively contribute to social competence even in the face of linguistic challenges.

Second Language Learners and Bilingual children in specific language groups

The next step in the analyses was to investigate, for each of the twelve most frequent language groupings, whether the children who were Second Language Learners had different EDI outcomes than children who were Bilingual (speaking the language of instruction and another language), and whether either of these groups had different outcomes than the Language-control group. This investigation may shed more light on the diversity of outcomes in relation to specific language/cultural background. Arguably, the SLL group can be perceived as a proxy for families with a history of quite recent immigration, while the BIL group may be perceived as a group of bilingual children raised in families whose cultural and linguistic identity remains salient to them, yet the children have been in a Canadian context a sufficient length of time to become acculturated and conversant. However, we have no additional data to support this perception for this particular sample.

Tables 11 and 12 show summary results of comparing EDI scores between Second Language Learners (SLL), , Bilingual children (BIL) and Language-controls for each language grouping in each database, for the SLL and BIL groups separately. Outcomes could be: no statistical difference (=), significantly better scores (>), or significantly lower scores (<).

For the top twelve language groups, N varied from 31 to 2965 children in the SLL group and 277 to 1166 in the BIL group.

To establish these differences, analyses of variance (ANOVA) and post hoc Tukey's Honestly Significant Differences tests (HSD) were conducted. An ANOVA reports if there are any statistically significant differences among the three groups. A Tukey's HSD indicates which of the combinations or pairs are different from each other. Only differences statistically significant at the $p<0.05$ level when controlling for age and gender among the groups were

considered. The variety of outcomes for each subpopulation was tallied. These include: no difference between Bilingual and Language-control (BIL = L-Ctrl) or between SLL and Language-Control (SLL = L-Ctrl); Bilingual or SLL significantly greater than Language-controls (BIL > L-Ctrl or SLL > L-Ctrl), or less than Language-controls (BIL < L-Ctrl or SLL < Ctrl) and comparisons between the SLL and Bilingual groups (BIL > SLL, BIL < SLL, or BIL= SLL). These analyses present a significantly more nuanced understanding of the impact of language (and culture) on children's developmental outcomes.

Second Language Learners versus Language-control Group

As explained before, the Language-control Group consisted of children who spoke only the language of instruction (English or French, depending on the school board), but no other languages. Thus, effectively, SLL vs L-Ctrl are largely comparisons of two monolingual groups, of which one has the advantage of attending school in the language they know, and the other has the disadvantage of attending in the language they do not know. Despite this obvious disparity, the SLL groups did not do worse than the Language-control group in all school readiness domains all the time (Table 10).

Table 11 SLL groups among 12 language groupings compared with controls (L-ctrl). Numbers for each domain indicate the number of languages in which there were statistical differences (< or >), or no differences (=). Language groupings in each category are listed in the alphabetical order

	SLL>L-ctrl	SLL=L-ctrl	SLL<L-ctrl
Physical Health & Well-Being	1 Mandarin	5 Cantonese, Italian, Polish, Portuguese, Tamil	6 Arabic, Filipino, Punjabi, Spanish, Urdu, Vietnamese
Social Competence		2 Filipino, Italian	10 Arabic, Cantonese, Mandarin, Polish, Portuguese, Punjabi, Spanish, Tamil, Urdu, Vietnamese
Emotional Maturity		4 Italian, Polish, Portuguese, Tamil	8 Arabic, Cantonese, Filipino, Mandarin, Punjabi, Spanish, Urdu, Vietnamese
Language & Cognitive Development		3 Italian, Mandarin, Tamil	9 Arabic, Cantonese, Filipino, Polish, Portuguese, Punjabi, Spanish, Urdu, Vietnamese
Communication & General Knowledge			12 Arabic, Cantonese, Filipino, Italian, Mandarin, Polish, Portuguese, Punjabi, Spanish, Tamil, Urdu, Vietnamese

The SLL groups had the best outcomes in the Physical Health and Well-being domain. In half of the language groupings, the SLL children are at the same level or better than the Language-control group.

In the remaining four domains, the SLL groups were scoring poorer than the Language-control group in the overwhelming majority of language groups. A few groups scored on par with the Control group in the social, emotional and language-cognitive domains. The only consistent group through these three domains were the Italian-only speaking children. As expected, all the SLL groups scored lower than the Language-control group in the Communication and General Knowledge domain.

Second Language Learners vs Bilingual groups

Outcomes of domain comparisons between the SLL and Bilingual groups clearly demonstrated the advantage Bilingual children have (Table 12).

Table 12 **SLL groups among 12 language groupings compared with corresponding bilingual (Bil) group. Numbers for each domain represent the number of languages in which there were statistical differences (< or >), or no differences (=). Note that there were no domains in which the SLL group scored significantly better than the BIL group. Language groupings in each category are listed in the alphabetical order.**

	SLL=BIL	SLL<BIL
Physical Health & Well-Being	3 Italian, Polish, Portuguese,	9 Arabic, Cantonese, Filipino, Mandarin, Punjabi, Spanish, Tamil, Urdu, Vietnamese
Social Competence	2 Italian, Portuguese,	10 Arabic, Cantonese, Filipino, Mandarin, Polish, Punjabi, Spanish, Tamil, Urdu, Vietnamese
Emotional Maturity	3 Italian, Portuguese, Tamil	9 Arabic, Cantonese, Filipino, Mandarin, Polish, Punjabi, Spanish, Urdu, Vietnamese
Language & Cognitive Development		12 Arabic, Cantonese, Filipino, Italian, Mandarin, Polish, Portuguese, Punjabi, Spanish, Tamil, Urdu, Vietnamese
Communication & General Knowledge		12 Arabic, Cantonese, Filipino, Italian, Mandarin, Polish, Portuguese, Punjabi, Spanish, Tamil, Urdu, Vietnamese

The SLL group never scored better on any domain, and only occasionally at par with the Bilingual group. The Italian-only and Portuguese-only speaking children were at least at par with their Bilingual counterparts in three of the EDI domains. The Polish-only speaking group was no different than the Bilingual Polish in Physical Health and Well-being, and the Tamil-only

speaking group was no different than the Bilingual Tamil in the Emotional Maturity domain. Otherwise, for the overwhelming majority of the language groups, the Bilingual groups scored better than the SLL groups.

While, as mentioned previously, having more than language, and one of them the language of instruction, conveys obvious advantages over not being able to function in the language of instruction, it would be intriguing to explore possible mechanisms through which such powerful differences exist in kindergarten in all domains of development. It is possible that parental and process factors such as parents' expectations of what skills are necessary to develop for school (and who is responsible to teach these), exposure to pre-academic experiences such as daycare, or the process of adjustment to a new culture, climate and routine play a very important role. We were unable to control for socioeconomic status in these analyses, or time of immigration. It is possible that children who are functional in both languages have parents who are more likely to also speak more than one language and more likely to be employed, thus providing, on top of bilingualism, economic advantage. All these factors need to be considered in more detail in future research.

Bilingual vs Language-control groups

The comparisons between children who are functionally fluent in two languages, one of them the language of instruction (Bilingual), and children who are fluent in the language of instruction only (Language-control) are of particular interest, as they may reveal where there are potential advantages or disadvantages, as early as the kindergarten year, in having mastered more than one language. The results are in Table 13.

Table 13 Bilingual (BIL) groups among 12 language groupings compared with Language control group (L-ctrl). Numbers for each domain represent the number of languages in which there were statistical differences (< or >), or no differences (=). Language groupings in each category are listed in the alphabetical order

	BIL>L-ctrl	BIL=L-ctrl	BIL<L-ctrl
Physical Health & Well-Being	11 Arabic, Cantonese, Filipino, Italian, Mandarin, Polish, Punjabi, Spanish, Tamil, Urdu, Vietnamese	1 Portuguese,	
Social Competence	8 Cantonese, Filipino, Italian, Mandarin, Polish, Punjabi, Urdu, Vietnamese	3 Arabic, Spanish, Tamil	1 Portuguese
Emotional Maturity	7 Cantonese, Filipino, Italian, Punjabi, Tamil, Urdu, Vietnamese	5 Arabic, Mandarin, Polish, Portuguese, Spanish	
Language & Cognitive Development	6 Cantonese, Filipino, Italian, Mandarin, Polish, Urdu	4 Arabic, Punjabi, Tamil, Vietnamese	2 Portuguese, Spanish,
Communication & General Knowledge	1 Italian,	4 Arabic, Cantonese, Mandarin, Tamil	7 Filipino, Polish, Portuguese, Punjabi, Spanish, Urdu, Vietnamese

Research indicates that children who have relatively strong and equal abilities in two languages demonstrate advantages in many areas of cognitive and linguistic functioning, including metacognitive, metalinguistic, and sociolinguistic, when compared with monolingual children (Winsler, Díaz, Espinosa & Rodríguez, 1999). EDI results showed that the Bilingual group scored very well across the domains in comparison with the Language-control group. All twelve groups had mean scores at or above the Language-control group on Physical Health and Well-being and Emotional Maturity. In the Social Competence domain, eleven of twelve groups

scored at or above the Language-control group. Even in the Language and Cognitive domain, ten of twelve groups were at or above the Language-control group. Clearly, in these four domains there were obvious strengths and advantages to being bilingual. Part of the benefit in the social and emotional domains may be the result of additional roles that these children may take on by being bridges between their monolingual peers on either side or by being coaches to their counterparts who have difficulty with the language of instruction.

In the Communication and General Knowledge domain, there were more uneven results in terms of the distribution of groups. Almost all Bilingual groups scored at the same level or worse than the Controls. As mentioned previously, while describing the overall results (page 23), this result, while somewhat counterintuitive, may be a consequence of the child's lesser familiarity with the everyday language in the school's English or French in comparison with their first language. Our data does not allow distinguishing between bilingual children who were exposed to their first language as well as English/French approximately simultaneously (that is, from birth) versus those who learned the first language before they acquired fluency in English/French (sequentially). Recent research indicates that the simultaneous bilinguals show less proficiency in either language than those who acquired both languages early, but simultaneously (Sebastian-Gallés, Echeverria, & Bosch, 2005; Werker, Maurer, & Yoshida, 2009). These findings are ascribed to the interference between the two languages.

The Bilingual language groups who were not significantly different than the controls in the Communication and General Knowledge domain were: Arabic, Cantonese, Mandarin, and Tamil. Italian Bilingual children scored better than the Control group. There does not seem to be an obvious pattern to which language groups offer these best-case outcomes. Most of them would historically be from relatively new immigrant source countries. It would seem then that

pooling differences which exist on a language by language basis can obliterate these real and salient differences which can be observed when comparing them in the case-by-case manner as done earlier against the Language-control group. This is a critical factor in research focused on second language learners and bilingual children, since averaging the scores of children from different language backgrounds may well result in non-significant differences or quite variable results from study to study.

Once again, the limitations of our comparisons have to be considered. Research from both Canada and the US indicates that ethnicity, single parenting and SES are often interrelated (Pagani, Jalbert, Lapointe, & Hebert, 2006; Patterson, Kupersmidt, & Vaden, 1990). Thus, our results can be confounded by the impact of poverty. In Canada, large national studies indicate that immigrant children (those most likely to contribute to our SLL group) are likely to catch up to their peers by age 10 to 15 (Georgiades, Boyle & Duku, 2007; Statistics Canada 2002c, 2004; Worsick, 2001). These results, however, are subject to two major limitations: first, they do not distinguish among language groups, second, they tend to underrepresent children from families where parents do not speak English or French, thus possibly skewing the outcomes towards the groups that are likely to be more successful.

Overall Conclusions

This report summarized and interpreted results of an investigation of patterns of school readiness in two important, yet infrequent at a community level, kindergarten populations: children with special needs, and children with diverse language backgrounds. These analyses were made possible on the basis of the population-based data collected with the Early Development Instrument.

Two main questions guided the analyses in the report: 1) are patterns of school readiness different among children with special needs than those without, and in particular in respect to the type of need?, 2) are patterns of school readiness different among children with diverse language backgrounds, and in particular in respect to the specific language and fluency in the language of instruction? The answer to both questions is yes, these special groups are different in their school readiness patterns than children without these characteristics.

The analyses revealed many expected patterns, in particular among the children with special needs, who have lower levels of school readiness than other children. However, we were also able to explore differences and similarities among various special needs categories – a task impossible with data from single sites – and found that students with visual and hearing impairments were the least disadvantaged in school readiness outcomes.

Somewhat in parallel, while there is evidence of school-based outcomes for children with diverse language backgrounds, data are rarely available in sufficient numbers to allow for detailed description of specific language groups. The analyses for these categories revealed that while there are overall patterns, often along expected lines when children are broadly categorized regardless of their language of origin, a more intricate picture can emerge when different language subgroups are compared. For example, we found that children fluent in English and Italian had consistently very good school readiness outcomes; and that the Physical Health and Well-being domain was the one where second language learners were the least likely to be disadvantaged.

While these analyses posed more questions than they answered, our report makes it very clear that it is crucial to collect and explore population level data. The results can guide practical

intervention and prevention strategies at school and before, as well as provide broad-based background for more detailed, in depth investigations of specific populations.

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