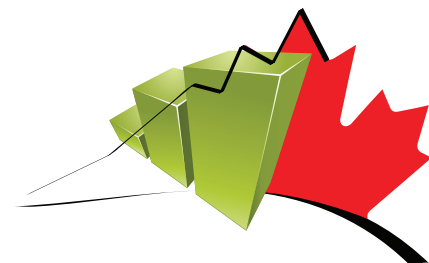**Economic and Social Reports**

Official language proficiency and immigrant labour market outcomes: Evidence from test-based multidimensional measures of language skills

by Li Xu and Feng Hou

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Official language proficiency and immigrant labour market outcomes: Evidence from test-based multidimensional measures of language skills

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Abstract

Numerous studies have demonstrated that higher proficiency in the language spoken in the destination country improves immigrant labour market outcomes. However, because of a lack of objective measures of language skills, previous studies have mainly drawn on subjective measures of language proficiency and were confined to the effect of only one dimension or general language skills. This study examines the effects of test-based measures of official language proficiency in four dimensions—listening, speaking, reading and writing—on immigrant employment and earnings. The analysis focuses on economic principal applicants admitted through the Express Entry (EE) system who immigrated to Canada from 2015 to 2018. A self-reported language measure based on self-reported knowledge of official languages at immigration and mother tongue is also examined for comparison.

The analysis of employment outcomes shows that in the initial years after immigration, test-based language measures in all four dimensions, as well as the self-reported language measure, had little effect on the incidence of employment. The analysis of earnings, however, shows that the predictive power and the marginal effect of each of the four dimensions of test-based language measures were much stronger than those of the self-reported measure, indicating that using the latter can considerably underestimate the effect of language skills on earnings. The four test-based measures of official language skills all had independent positive effects on earnings. Reading tended to have a stronger predictive power and a larger marginal effect than the other three dimensions, but the differences across the four dimensions were generally small. The tested official language skills were as important as pre-immigration Canadian work experience and more important than the educational level and age at immigration in predicting initial earnings of principal applicants admitted under the EE system.

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Introduction

Proficiency in the destination country's official language gained much importance with the rapid increase of people immigrating from non-English-speaking countries to major immigrant-receiving countries and has been seen as an important component of immigrants' human capital (Chiswick, 1991; Chiswick & Miller, 2003, 2014; Dustmann & van Soest, 2001; Picot, 2008). Empirical studies have demonstrated that destination language proficiency is key to immigrants' labour market success. Higher language proficiency increases immigrant workers' earnings (e.g., Chiswick & Miller, 2002; Dustmann & Fabbri, 2003), employment probability (e.g., Arkoudis et al., 2009; Aldashev, et al., 2009) and occupational attainment (e.g., Chiswick & Miller, 2009; Huot et al., 2018). Furthermore, language proficiency plays an important role in improving the transferability of foreign education and work experience (Boyd & Cao, 2009; Chiswick & Miller, 2003; Daley, et al., 2019; Warman, et al., 2015).

Despite the sustained interest among immigration scholars to understand the roles of destination language proficiency in immigrants' labour market integration, objective measures of language proficiency have rarely been available. Studies in this area have largely relied on self-assessed language proficiency measures, which are prone to measurement errors (Chiswick & Miller, 2014; Dustmann & van Soest, 2001; Edele et al., 2015). Because of the lack of detailed information, studies have mostly examined only one dimension of language proficiency, often oral fluency, or general language skills[1] (e.g., Boyd & Cao, 2009; Evans, 1987; Grondin, 2005; Miranda & Zhu, 2013). These data deficiencies do not allow for an accurate estimate of the effect of immigrants' language proficiency on their labour market outcomes.

In Canada's current Express Entry (EE) immigration application management system, all principal applicants (PAs) of economic immigration programs are required to take an official language test, and the results are assessed against the Canadian Language Benchmarks (CLB) for English and the Niveaux de compétence linguistique canadiens (NCLC) for French. An individual's English or French ability is assessed for four language skills: listening, speaking, reading and writing.

This study uses this newly available information to improve knowledge of the effect of different dimensions of language proficiency on the employment and earnings of economic PAs. The analysis will enrich the evidence base on the selection of economic immigrants and integration policy and programs.

This study asks four questions: (1) Do language test scores, compared with self-reported language ability, improve the predictive power of official languages for labour market outcomes of economic immigrants? (2) What is the relative importance of the four official language skills: listening, speaking, reading and writing? (3) How do official language skills mediate the effects of other key human capital factors on earnings among immigrants; i.e., to what extent does the inclusion of official language skills alter the effect of other human capital factors? (4) Does the effect of language test scores differ by immigration admission program?

The paper is organized as follows: Section 2 discusses the literature on language and immigrant labour market outcomes. Section 3 describes the data and methods of this study. Section 4 presents the results. Section 5 concludes.

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1. For example, language measures constructed from self-reported mother tongue, home language and knowledge of the destination-country language.

Immigrants' language proficiency and labour market outcomes

Studies about the impact of destination-country language proficiency on immigrant labour market outcomes have largely focused on earnings (Boyd & Cao, 2009; Chiswick, 1991; Chiswick & Miller, 2003, 2014; Daley, et al., 2019; Dustmann & van Soest, 2001; Rooth & Saarela, 2007). Since objective measures of language proficiency based on test results are expensive to obtain and rarely available in large surveys, studies have mainly relied on self-reported language measures, which are often based on mother tongue, home language, self-assessed ability to converse, etc. Such information has typically been collected in censuses and some specialized surveys conducted in major immigrant-receiving countries, including Canada, the United States and Australia. Various subjective indicators of destination-language proficiency have been defined using one of these measures or a combination thereof to examine their effect on earnings (Chiswick & Miller, 1990).

Although estimates of the size of the language effect vary considerably across studies depending on the immigrant population studied, as well as the language indicator and methodology used, studies have consistently demonstrated a strong positive relationship between immigrants' destination-language proficiency and their earnings (Boyd & Cao, 2009; Chiswick & Miller, 1990, 2002, 2003, 2014; Daley, et al., 2019; Dustmann & van Soest, 2001; Rooth & Saarela, 2007). For example, Chiswick and Miller (2002, 2003) found that, based on data from censuses in Canada, the United States and Australia on immigrants' self-assessed ability to converse in the country's official language and their home language, immigrants who speak English very well earn significantly more than those who cannot carry a conversation in English.

However, the advancement of research in this area has been curtailed by the long-standing lack of precision in measuring immigrant language proficiency in large datasets (Picot, 2008). Studies that rely on subjective measures of language proficiency based on self-reported language skills, home language and mother tongue have several limitations.

First, self-assessed language proficiency measured on an ordinal scale is likely to suffer from misclassification errors. Using such indicators can lead to an underestimation of the language effect. A study drawing from concordant self-assessments and interviewer assessments of language proficiency suggests that an interviewer's assessment leads to higher earnings returns for an immigrant's English proficiency than does a self-assessment (Akresh & Frank, 2011). Several studies use an instrumental variable approach to address possible biases associated with measurement errors, and they show that such measurement errors can result in substantial underestimation of the earnings effect of language skills (Dustmann & van Soest, 2001, 2002; Dustmann & Fabbri, 2003).

Second, studies based on self-reported language information often employ dichotomous or trichotomous scales of language proficiency. Even when more detailed self-reported proficiency levels are available in some datasets, studies often reduced the scale to two levels to minimize potential measurement errors (Chiswick, 1991; Chiswick & Miller, 2014; Dustmann, 1994). Taking advantage of several self-reported language characteristics of immigrants in the censuses or surveys, some studies use answers to fluency questions in conjunction with answers to home language and mother tongue questions to differentiate more than two categories of language skills. A common issue with the language indicators constructed from such information is that often only the top and bottom categories may reflect high and low proficiency levels. Categories in the middle can contain mixed levels of fluency. For example, in the five levels of the language measure constructed from the Canadian census (e.g., Boyd & Cao, 2009), one middle category is characterized as "non-official mother tongue, non-official language spoken at home, but self report with ability to carry conversation in English or French." This category can include some immigrants with a high, intermediate or basic proficiency level. Studies using these crude measures cannot differentiate earnings by language proficiency levels among individuals with non-official languages as their mother

tongue and home language. In addition, language indicators constructed using mother tongue and home language information may also capture the effect of workers' other characteristics, such as source country and ethnicity (Chiswick & Miller, 2003).

Third, previous studies often relied on one dimension of language proficiency—mostly oral fluency—or general language skills (e.g., Boyd & Cao, 2009; Grondin, 2005). A limited number of studies benefiting from data with measures of more than one dimension of language proficiency provide insight that different language skills may not be rewarded equally in the labour market (Chiswick, 1991; Dustmann & Fabbri, 2003). However, very few datasets contain measures of more than one dimension of language proficiency. Some datasets are based on small, special samples; hence, the findings cannot be used to make inferences for the general immigrant population. These few studies provide inconsistent findings on the relative importance of the different dimensions of language skills.

For example, Chiswick's (1991) pioneer research examined the earnings effect of self-reported English reading ability and speaking fluency for a sample of adult illegal immigrant men. The study sample—composed mostly of Mexicans living in the United States—is relatively small[2] and characterized by low English fluency and low education. The study found that reading ability has a greater effect on earnings than speaking fluency. It emphasized that "measures of reading skills are more important statistically for understanding labour market outcomes than merely measures of speaking English." Through the use of self-reported English writing ability and speaking fluency information from a small sample of a United Kingdom survey, Dustmann and Fabbri (2003) reported that English writing ability is a more important determinant of employment, but English speaking fluency is a more important determinant of earnings. The study suggested that, in addition to speaking fluency, literacy in the destination language is important for obtaining a job.

Taking advantage of self-assessed speaking fluency and writing proficiency in a German survey, Dustmann (1994) examined the effect of these two dimensions of German language skills on earnings. The study found that both dimensions of language ability, especially writing ability, improve immigrants' earnings considerably. The 1992 National Adult Literacy Survey from the United States contained four dimensions of language skills—speaking, reading, writing and understanding of spoken English. Using the rich language information from this survey, Carnevale, Fry and Lowell (2001) found that immigrants' ability to understand the spoken word is the most important language skill for earnings.

Accurately estimating the effects of various language skills on immigrant earnings and other labour market outcomes is important for developing immigration selection policy and designing integration programs such as language training programs. Findings from existing studies indicate the importance of the language factor for selecting economic immigrants for labour market success. However, because of data limitations, the findings provide limited guidance when determining the importance of language relative to other human capital factors, the allocation of selection points across objectively measured proficiency levels and the development of language training programs.

The present study contributes to the literature in several important ways. First, it is based on a large sample of economic immigrants whose official language skills are assessed through standardized tests and matched to a national language ability benchmark. Objectively assessed official language skills can help overcome major limitations of studies that rely on self-reported language measures in estimating the effect of official language proficiency on immigrant labour market outcomes. Accordingly, this study examines the extent to which self-reported measures of official language skills may underestimate the role of official language skills in immigrant labour market outcomes. Second, this study examines the relative importance of the four official language skills—listening, speaking, reading and writing—and their effect on immigrant labour market outcomes. While a few previous studies compared two or three

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2. The sample size is 380 and 605, respectively, for the analysis of weekly earnings and hourly wages.

dimensions of language ability, they were generally based on small samples, specific populations and self-reported measures of language ability. The findings of the present study are more comprehensive and reliable than those of previous studies. Third, the present study further examines the role of official language ability in accounting for the effects of other key human capital factors on immigrant labour market outcomes. This analysis improves the understanding of the mechanisms through which key human capital factors affect immigrant economic outcomes. Finally, this study examines whether the effect of official language skills differs across economic immigration admission programs that have different requirements for official languages.

Data, measures and methods

Data

This study uses the Longitudinal Immigration Database (IMDB), which combines the immigration records and annual tax information of immigrants (Statistics Canada, 2021). The immigration records contain immigrant characteristics such as admission class (e.g., economic class, family class and refugee), age, education, marital status, source country and official language abilities at the time of immigration. Tax records provide information on annual incomes, current marital status and place of residence. The IMDB file used for this study covers immigration information up to 2020 and tax information up to 2019.

The analysis is restricted to economic PAs who became landed immigrants between 2015 and 2018 and were selected through the EE system (referred to as EE immigrants thereafter). The EE system was introduced in 2015, and it uses the Comprehensive Ranking System (CRS) to assign points to PAs based on their age, level of education, official language proficiency, pre-immigration Canadian work experience, and several factors related to transferability of education and foreign work experience. From 2015 to 2018, new applicants were assessed through the EE system, while the backlog of earlier applicants was still assessed through the previous points system. Only PAs who went through the EE system have detailed information on their official language level based on standardized tests.

The analysis is further restricted to EE immigrants who were aged 20 to 54 at the time of immigration and who filed a tax return in any of the first four years after immigration. For EE immigrants who landed in 2015, four years are available for observing their outcomes, while only one year is available for those who landed in 2018. The total unique observations are 100,930: 5,570 for the 2015 landing year, 17,000 for 2016, 35,640 for 2017 and 42,920 for 2018. The analysis of earnings includes those whose annual earnings were $500 or more (in 2019 constant dollars) in any of the first four years after immigration; total unique observations are 96,880: 5,520 for the 2015 landing cohort, 16,630 for 2016, 34,670 for 2017 and 40,060 for 2018.

Measures

The main outcome variable is annual employment earnings (wages and salaries plus net self-employment income, in 2019 constant dollars) during the first four years after immigration. Annual employment earnings measure the economic gain a worker obtained from the labour market. They are determined by total hours of work and hourly earnings, neither of which can be distinguished in the administrative tax data. The logarithm transformation of employment earnings is used in regression models. In additional analysis that is briefly discussed in the results section, the incidence of employment, defined as having positive employment earnings in a tax year, is also used as an outcome variable.

Official language proficiency measures are the focal independent variables in this study. Under the EE system, PAs need to take an approved test, and the results are assessed against the CLB for English and the NCLC for French.[3] English or French language ability is assessed along four dimensions: listening, speaking, reading and writing. PAs must reach minimum CLB or NCLC levels, which vary by immigration program and language dimension.[4] The minimum language requirements screen out applicants who have poor English or French abilities. Accordingly, the range of language skills was limited among PAs in this study, and this may reduce the power of language skills in accounting for the variation in earnings. Therefore, the results of this study apply to PAs admitted through the EE system and may not be applicable to immigrants in general.

The analysis uses the four dimensions of official language ability, measured in CLB or NCLC levels. Because of the minimum language requirement and top coding in the database, the levels of these measures range from 4 (basic ability: fluent) to 10 and above (advanced ability: above initial) for reading and writing, and from 5 (intermediate ability: initial) to 10 and above for listening and speaking.[5] In the CRS, applicants who have knowledge of a second official language can get their levels tested and assessed against the CLB or NCLC to get additional language points.[6] The measures for the second official language skills are not examined in this study since a small proportion (less than 3%) of PAs had their second official language ability assessed.

For comparison purposes, this study considers a conventional measure of official language ability used in many previous studies based on the IMDB (e.g., Hou & Bonikowska, 2018). It is derived from the combination of mother tongue and self-reported knowledge of official languages at arrival: English mother tongue, French mother tongue, other mother tongue but speak English, other mother tongue but speak French, and other mother tongue but speak English and French. All PAs spoke either English or French because of the minimum language requirements of the CRS.

The multivariate analysis controls for the following covariates: year of immigration, years since immigration, gender, age at immigration, years of pre-immigration Canadian work experience, educational level at immigration, admission program, source region, school attendance after immigration and province of residence.[7] Age at admission is coded into six groups (20 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44 and 45 to 54). Years of pre-immigration Canadian work experience are derived from the years with positive employment earnings in Canada before becoming a permanent resident. The five-category education variable is based on highest credential levels as collected in the CRS: high school or less, one- to two-year postsecondary credential, bachelor's degree or three-year postsecondary credential, two or more postsecondary credentials (must include a three-year postsecondary credential),

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3. The CLB is a 12-level scale of language ability in English as a second language (ESL). The NCLC is its equivalent for French as a second language (FSL). The scale reflects the progression of language learning from basic to intermediate and advanced ability among adult ESL and FSL learners. Levels 1 to 4 represent the basic stages initial (1), developing (2), adequate (3) and fluent (4). Levels 5 to 8 represent the intermediate stages initial (5), developing (6), adequate (7) and fluent (8). Levels 9 to 12 represent the advanced stages initial (9), developing (10), adequate (11) and fluent (12). For more details, see Gauthier, M.E. (2019).
4. The minimum CLB or NCLC level for the Federal Skilled Worker Program is level 7 for each of the four language dimensions. The minimum level for the Canadian Experience Class is level 7 for National Occupational Classification (NOC) level 0 or A, and level 5 for NOC level B. The minimum level for the Federal Skilled Trades Program is level 5 for listening and speaking, and level 4 for reading and writing. Provincial Nominee Program applicants who go through the EE selection must meet the same minimum language requirement as one of the three federal programs. For more details, see IRCC (n.d.).
5. These scales can be treated as continuous (assuming their effect on log earnings is linear) or categorical (no linear assumption). The analysis compared the predictive powers of the two approaches and showed that categorical scales had slightly larger unique R-squared values than continuous scales. Only the results treating the scales as categorical are presented for parsimony.
6. Applicants with second official language ability can receive up to 24 additional points in the CRS.
7. In additional analysis for sensitivity tests, the skill level of intended occupations is included as a control variable. This factor is a significant predictor of earnings. Its inclusion tends to strongly affect the earnings differences by admission program but has little impact on the effect of tested language abilities.

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and graduate degree (master's level or first professional degree, and doctoral level). The admission program includes four categories: Federal Skilled Worker Program (FSWP), Provincial Nominee Program (PNP),[8] Canadian Experience Class (CEC) and Federal Skilled Trades Program (FSTP). Source region was coded into 14 categories: United States, Central America, Caribbean, South America, Northern Europe, Western Europe, Southern Europe, Eastern Europe, Africa, Southern Asia, Southeast Asia, East Asia, West Asia and other regions. School attendance after immigration is measured by months of attending full-time postsecondary education, derived from tax deductions for education.

Methods

The analysis starts with a descriptive table showing the distribution of the four dimensions of the official language abilities. The simple correlations between the four dimensions are calculated to show their levels of independence. The average tested official language levels by category of self-reported language ability and key human capital factors are examined.

Multivariate analysis is used to examine the predictive power of the four dimensions of the official language skills—first, each dimension separately, then the four dimensions jointly—in explaining the variation in employment and earnings among EE immigrants. The predictive power is measured by the difference in the model R-squared value between a regression model with the language ability measure(s) and a model without the language variable(s). For comparison purposes, the same analysis is performed using the self-reported language measure. These analyses are intended to answer this study's first two questions about whether tested language skills better predict employment and earnings than the conventional self-reported official language ability, and the relative importance of the four dimensions of language skills.

The coefficients of the multivariate model predicting earnings are compared across the following models: the base model that contains all the selected control variables, the model that adds the self-reported language measure to the base model, the models each adding one of the four dimensions of tested language skills to the base model, and the model adding all four dimensions to the base model. These comparisons are intended to answer this study's third question regarding how the inclusion of those language measures mediates the effects of other key predictors of earnings.

Finally, multivariate analyses are run by admission program. Since each of the four admission programs in the EE system has different requirements for official language skills, understanding whether the effects of tested official language skills on earnings vary by admission program is relevant to immigrant selection policy.

Results

Tested official language skills among Express Entry immigrants

Table 1 shows the distribution of the four dimensions of tested official language skills among PAs admitted through the EE system. Over 90% of EE immigrants had official language skills at or above the CLB or NCLC level 7 (adequate intermediate ability) in each of the four dimensions because of the minimum language requirement of the CRS. EE immigrants' official language skills were highest in reading (with 77% with advanced ability), followed by speaking (70%) and listening (67%), and lowest in

8. For the PNP, this study includes only PAs of the Enhanced Provincial Nomination program admitted through the EE system. PAs of Base Provincial Nomination programs, which are not managed by the EE system, are not included.

writing (55%). The variation across the four dimensions likely implies that writing is more difficult to master than the other three dimensions when learning English or French as a second language.

Table 1
Distribution of official language skill levels among principal applicants admitted through the Express Entry system, 2015 to 2018 arrivals

	Listening	Speaking	Reading	Writing
		percent		
Official language level				
4—Basic language ability: fluent	…	…	0.5	0.4
5—Intermediate language ability: initial	2.1	2.4	2.6	2.3
6—Intermediate language ability: developing	2.6	3.7	4.0	4.5
7—Intermediate language ability: adequate	16.6	10.6	7.1	16.8
8—Intermediate language ability: fluent	11.4	13.1	9.2	20.9
9—Advanced language ability: initial	17.4	19.9	24.8	27.6
10—Advanced language ability: above initial	49.9	50.3	51.9	27.6

… not applicable
Note: The total number of observations is 100,930.
Source: Statistics Canada, Longitudinal Immigration Database, 2020.

The four dimensions of official language skills were moderately correlated. The Pearson correlation coefficient ranged from 0.50, between listening and speaking, to 0.68, between reading and listening. With these moderate correlations, the four dimensions of language skills would have some overlapping effects on immigrant labour market outcomes, but they should also have unique, independent effects.

Table 2 presents the frequency distribution of self-reported official language categories and the average levels of tested listening, speaking, reading and writing skills across these categories among EE immigrants. The majority (80%) reported having a mother tongue other than an official language but speaking English, and 16% reported English as their mother tongue. Very few with a mother tongue other than English or French spoke French or both French and English (1.4% together). The number of people who reported French as their mother tongue was also small (2%).

Table 2
Mean tested official language levels by selected characteristics among principal applicants admitted through the Express Entry system, 2015 to 2018 arrivals

| | Frequency | Tested official language skill level | | | |
		Listening	Speaking	Reading	Writing
	percent		mean level		
Self-reported official language ability					
Other mother tongue, English and French	1.1	9.28	9.48	9.47	9.10
Other mother tongue, French	0.3	9.17	9.57	9.14	9.24
Other mother tongue, English	80.3	8.73	8.76	8.91	8.30
French mother tongue	2.2	9.61	9.75	9.64	9.55
English mother tongue	16.1	9.58	9.76	9.58	9.20
Age at immigration					
20 to 24	5.3	8.75	8.87	8.90	8.18
25 to 29	42.1	8.92	9.01	9.12	8.48
30 to 34	32.4	9.00	9.03	9.12	8.62
35 to 39	13.7	8.79	8.82	8.89	8.45
40 to 44	4.2	8.52	8.62	8.62	8.19
45 to 54	2.2	8.40	8.55	8.42	8.08
Pre-immigration Canadian experience					
No	33.3	9.36	9.49	9.46	9.14
Yes	66.7	8.66	8.69	8.83	8.16
Education at immigration					
High school or less	9.3	7.79	7.58	7.34	7.02
One- to two-year postsecondary credential	7.3	8.16	8.28	8.20	7.63
Bachelor's degree or three-year postsecondary credential	25.8	9.05	9.08	9.25	8.63
Two or more postsecondary credentials	18.1	8.78	8.96	9.04	8.36
Graduate degree	39.5	9.23	9.32	9.45	8.95
Admission program					
Federal Skilled Worker Program	35.5	9.59	9.61	9.62	9.30
Provincial Nominee Program	17.7	8.36	8.64	8.73	8.11
Canadian Experience Class	44.1	8.67	8.68	8.87	8.13
Federal Skilled Trades Program	2.7	6.72	6.77	6.15	6.06

Note: The total number of observations is 100,930.
Source: Statistics Canada, Longitudinal Immigration Database, 2020.

As one would expect, EE immigrants with English or French as their mother tongue had higher tested official language skills than those with other mother tongues. While tested official language skills were, on average, above CLB or NCLC level 9 (initial advanced ability) among EE immigrants with English or French as their mother tongue, the tested skills were below CLB or NCLC level 9 but above level 8 among EE immigrants with a mother tongue other than an official language but who speak English.

Table 2 also presents the average levels of tested official language skills by key human capital factors and admission program. EE immigrants aged 25 to 34 at immigration tended to have the highest levels of official language skills. EE immigrants without pre-immigration Canadian work experience had higher levels of official language skills than those with such experience. It is possible that applicants without pre-immigration Canadian work experience may need a higher tested language level to make up for their lack of points for Canadian work experience to reach the same total CRS scores. EE immigrants with a graduate degree had the highest official language skills, followed by those with a bachelor's degree. Across the four admission programs, immigrants in the FSTP had the lowest levels of official language skills, followed by those in the PNP. The FSWP had the highest level, above level 9 on average for all four dimensions of the tested language skills (see Appendix Table 1 for the distribution of language skill levels by program).

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Official language skills and incidence of employment

Table 3 shows the model R-squared values for various regression specifications predicting the incidence of employment for all EE immigrants and earnings for employed immigrants. The specifications basically follow the approaches in the studies by Carnevale et al. (2001) and Dustmann (1994) who examined the effects of different dimensions of language skills, both individually and as a whole. The top panel presents R-squared values from linear probability models with the incidence of employment as the outcome, while the bottom panel shows R-squared values from ordinary least squares models with the log annual earnings as the outcome.

There are three specifications for each outcome. The first contains only a language skill measure. The second adds all the selected control variables. The third excludes source region as this specification is intended to show the extent that official language skills overlap with source regions. In the analytical report that served as empirical evidence for the design of the CRS, immigrant source region was not considered when the relative importance of human capital factors was evaluated because source region is not a selection criterion (Bonikowska, Hou & Picot, 2015). It is possible that the self-reported language ability in this earlier research may, to some extent, reflect the effect of source region since English and French are more likely to be spoken in some source regions than in others.

The results in the top panel of Table 3 show that both self-reported and test-based language measures had a small effect on the incidence of employment, and the differences between them were small as well. When language was the only variable in the model, the R-squared value associated with each test-based language measure is negligible (less than 0.2% of the variation in the incidence of employment could be explained by a language skill measure). When control variables were added to the models, the language measures did not contribute much unique R-squared value to the model (column 2). For instance, the unique R-squared value associated with reading skills was 0.0004 (or 0.04% of the total variation in the outcome).[9] Even the unique R-squared value of the four dimensions of official language skills together was small (0.0007). The coefficients of each of the four dimensions show that higher levels of tested official language skills were associated with a higher incidence of employment, but the effects were generally small. For instance, the difference in the incidence of employment ranged from 1 percentage point, between CLB or NCLC level 5 and level 10 or above for speaking, to 3 percentage points for reading (data not shown here).

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9. The unique R-squared is calculated as the difference of R-squared between the model with the reading variable and the model without any language measure.

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Table 3

R-squared values of regression models predicting employment and earnings among principal applicants admitted through the Express Entry system, 2015 to 2018 arrivals

	No control	With full controls	No control for country of birth
		R-squared value	
Employment			
R-squared of the model with only control variables	…	0.0505	0.0428
Increase in R-squared with the addition of:			
Mother tongue and official language	0.0009	0.0001	0.0007
Listening	0.0004	0.0003	0.0010
Speaking	0.0005	0.0001	0.0007
Reading	0.0007	0.0004	0.0006
Writing	0.0015	0.0004	0.0011
All four language skill dimensions	0.0023	0.0007	0.0016
Earnings			
R-squared of the model with only control variables	…	0.1793	0.1508
Increase in R-squared with the addition of:			
Mother tongue and official language	0.0240	0.0010	0.0131
Listening	0.0217	0.0105	0.0233
Speaking	0.0189	0.0107	0.0252
Reading	0.0254	0.0173	0.0305
Writing	0.0205	0.0137	0.0283
All four language skill dimensions	0.0376	0.0234	0.0437

… not applicable

Note: Control variables include year of immigration, years since immigration, gender, age at immigration, years of pre-immigration Canadian work experience, education, source region, school attendance, immigration program and province of residence.

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

In the multivariate models that did not control for immigrant source region, the unique R-squared value associated with each dimension of tested language skills was slightly larger than that of the corresponding model controlling for source region but was still very small. The comparison between models with and without controlling for source region suggests that there were some overlapping effects between language skills and immigrant source region; but even when not controlling for source region, little differences were observed in the incidence of employment among EE immigrants by official language level. It is important to note that total R-squared values of multivariate models predicting the incidence of employment were small (around 0.051), indicating that other human capital factors as a whole explained relatively little of the variation in the incidence of employment.

Official language skills and annual earnings

The results in the bottom panel of Table 3 indicate that without controlling for covariates, the self-reported language measure had an R-squared value similar to each of the four dimensions of tested official language skills (column 1). However, when other predictors of earnings were included in the model, the test-based language ability measures were much more important than the self-reported language ability in predicting earnings. Adding the conventional (self-reported) language measure to the model with full control variables contributed little to the model R-squared (0.001), while adding each of the four test-based language ability measures increased the model R-squared value by 0.011 (listening) to 0.017 (reading). When the four measures were added together, the model R-squared increased by 0.023. To put these unique R-squared values in perspective, the unique R-squared value was 0.007 for education,

0.009 for age at immigration and 0.017 for pre-immigration Canadian work experience. Thus, the tested official language skills were more important than pre-immigration Canadian work experience, educational level and age at immigration in predicting earnings in the initial years after immigration.

For multivariate models not controlling for immigrant source region, the unique R-squared values associated with each dimension of tested official language skills were twice as large (ranging from 0.023 to 0.031) as those in models controlling for source region. The unique R-squared for the four dimensions as a whole was 0.044, compared with 0.023 in the model controlling for source region. Thus, in models not controlling for source region, tested official language skills captured some of the effect of source region on earnings. In comparison, the unique R-squared value of self-reported official language ability was 0.013 in the model not controlling for source region and 0.001 in the model controlling for source region. These results suggest that the self-reported language measure almost entirely overlapped with source region, while tested language skills could capture differences in the language skills of EE immigrants from the same source region.

In the models not controlling for source region, the four dimensions of tested official language skills together contributed more unique R-squared values (0.044) than pre-immigration Canadian work experience (0.020), age at immigration (0.013) and education at immigration (0.007). Thus, when source region was not controlled in the regression model, test-based language measures carried much more weight than other key selection criteria in the CRS in accounting for the variation in initial earnings among EE immigrants.

The four dimensions of tested official language skills had broadly similar effects in predicting earnings; the difference was generally not large. In all specifications where each dimension was separately included in the model, reading tended to have the largest unique R-squared value (Table 3). Immigrants with level 7 reading skills (intermediate language ability: adequate) earned about 25% less (or -0.294 log points) than those with level 10 or above reading skills (advanced language ability: above initial). In comparison, the corresponding earnings differences for listening, speaking and writing were 18% (or -0.198 log points), 19% (-0.212 log points) and 22% (-0.243 long points), respectively. When the four dimensions were included in the same model, they were all statistically significant, with reading having the largest marginal effect (last column of Table 4).[10] The difference in earnings between CLB or NCLC level 7 and level 10 or above was 17% (or -0.183 log points) for reading, compared with a difference of 11% (-0.111 log points) for speaking, 10% (-0.106 log points) for writing and 7.0% (-0.072 log points) for listening.

The marginal effects across levels of each dimension of official language skills show no clear earnings differences between CLB or NCLC levels 5 and 6 for listening and speaking, nor between CLB or NCLC levels 4 to 6 for reading and writing. Clear earnings gradients appeared from level 6 and above. This pattern held no matter whether the dimensions of official language skills were included individually or together in the regression models.

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10. When the self-reported language measure was added to Model 7 (the last column of Table 4), the coefficients of the four dimensions of tested official language abilities changed little, while the coefficients of the self-reported language measure became much smaller than those in Model 2. For instance, the coefficient for the "other mother tongue, speaking English" category became -0.032, about one-third of the corresponding coefficient in Model 2. These results suggest that the effect of the self-reported language measure was mostly captured by the tested language measures.

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Table 4
Regression models showing the effects of listening, speaking, reading and writing skills on log earnings among principal applicants admitted through the Express Entry system, 2015 to 2018 arrivals

	Model 1 No language	Model 2 Self-report	Model 3 Listening	Model 4 Speaking	Model 5 Reading	Model 6 Writing	Model 7 All four dimensions
				coefficient			
Intercept	11.412 ***	11.421 ***	11.368 ***	11.359 ***	11.342 ***	11.366 ***	11.330 ***
Age at landing (reference: 30 to 34)							
20 to 24	-0.057 ***	-0.058 ***	-0.085 ***	-0.090 ***	-0.093 ***	-0.083 ***	-0.111 ***
25 to 29	-0.052 ***	-0.052 ***	-0.064 ***	-0.065 ***	-0.066 ***	-0.062 ***	-0.072 ***
35 to 39	0.089 ***	0.089 ***	0.095 ***	0.094 ***	0.095 ***	0.093 ***	0.097 ***
40 to 44	0.186 ***	0.189 ***	0.199 ***	0.191 ***	0.196 ***	0.191 ***	0.198 ***
45 to 54	0.249 ***	0.251 ***	0.272 ***	0.252 ***	0.267 ***	0.253 ***	0.267 ***
Years of pre-immigration Canadian experience (reference: 0 years)							
1	0.309 ***	0.306 ***	0.323 ***	0.326 ***	0.320 ***	0.331 ***	0.335 ***
2	0.331 ***	0.329 ***	0.346 ***	0.352 ***	0.347 ***	0.355 ***	0.361 ***
3	0.304 ***	0.301 ***	0.321 ***	0.323 ***	0.324 ***	0.330 ***	0.337 ***
4	0.315 ***	0.312 ***	0.333 ***	0.335 ***	0.337 ***	0.343 ***	0.350 ***
5 or more	0.354 ***	0.350 ***	0.361 ***	0.362 ***	0.365 ***	0.368 ***	0.369 ***
Education at immigration (reference: graduate degree)							
High school or less	-0.179 ***	-0.182 ***	-0.119 ***	-0.099 ***	-0.054 **	-0.065 ***	-0.020
One- to two-year postsecondary credential	-0.337 ***	-0.337 ***	-0.291 ***	-0.287 ***	-0.244 ***	-0.257 ***	-0.216 ***
Bachelor's degree or three-year postsecondary credential	-0.011 *	-0.015 *	-0.010	-0.003	0.001	-0.001	0.002
Two or more postsecondary credentials	-0.207 ***	-0.208 ***	-0.193 ***	-0.194 ***	-0.181 ***	-0.182 ***	-0.169 ***
Admission class (reference: Federal Skilled Worker Program							
Provincial Nominee Program	-0.081 ***	-0.077 ***	-0.031 ***	-0.044 ***	-0.026 ***	-0.025 ***	0.009
Canadian Experience Class	-0.040 ***	-0.038 ***	0.001	0.000	0.009	0.018 **	0.041
Federal Skilled Trades Program	-0.234 ***	-0.230 ***	-0.089 ***	-0.113 ***	-0.062 ***	-0.071 ***	-0.008
Source region (reference: United States)							
Central America	-0.434 ***	-0.348 ***	-0.377 ***	-0.341 ***	-0.364 ***	-0.331 ***	-0.284 ***
Caribbean	-0.401 ***	-0.397 ***	-0.353 ***	-0.355 ***	-0.322 ***	-0.348 ***	-0.294 ***
South America	-0.243 ***	-0.158 ***	-0.189 ***	-0.153 ***	-0.189 ***	-0.162 ***	-0.110 ***
Western Europe	-0.258 ***	-0.121 ***	-0.239 ***	-0.234 ***	-0.230 ***	-0.241 ***	-0.216 ***
Northern Europe	-0.195 ***	-0.195 ***	-0.198 ***	-0.214 ***	-0.196 ***	-0.201 ***	-0.201 ***
Southern Europe	-0.390 ***	-0.303 ***	-0.332 ***	-0.281 ***	-0.316 ***	-0.280 ***	-0.228 ***
Eastern Europe	-0.439 ***	-0.352 ***	-0.365 ***	-0.335 ***	-0.348 ***	-0.329 ***	-0.263 ***
Africa	-0.489 ***	-0.422 ***	-0.421 ***	-0.429 ***	-0.399 ***	-0.426 ***	-0.354 ***
Southern Asia	-0.510 ***	-0.429 ***	-0.418 ***	-0.418 ***	-0.389 ***	-0.403 ***	-0.314 ***
Southeast Asia	-0.519 ***	-0.438 ***	-0.425 ***	-0.367 ***	-0.370 ***	-0.385 ***	-0.276 ***
Eastern Asia	-0.697 ***	-0.611 ***	-0.577 ***	-0.544 ***	-0.572 ***	-0.543 ***	-0.446 ***
Western Asia	-0.488 ***	-0.402 ***	-0.412 ***	-0.404 ***	-0.393 ***	-0.392 ***	-0.322 ***
Other regions	-0.179 ***	-0.174 ***	-0.177 ***	-0.186 ***	-0.181 ***	-0.180 ***	-0.181 ***

… not applicable
* significantly different from reference category (p < 0.05)
** significantly different from reference category (p < 0.01)
*** significantly different from reference category (p < 0.001)

Notes: Each model controls for landing year, years since landing, gender, months of school attendance and province of residence. The R-squared is 0.179 for Model 1, 0.180 for Model 2, 0.190 for Model 3, 0.190 for Model 4, 0.197 for Model 5, 0.193 for Model 6 and 0.203 for Model 7.
Source: Statistics Canada, Longitudinal Immigration Database, 2020.

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Table 4
Regression models showing the effects of listening, speaking, reading and writing skills on log earnings among principal applicants admitted through the Express Entry system, 2015 to 2018 arrivals (continued)

	Model 1 No language	Model 2 Self-report	Model 3 Listening	Model 4 Speaking	Model 5 Reading	Model 6 Writing	Model 7 All four dimensions
				coefficient			
Self-reported official language ability (reference: English mother tongue)							
Other mother tongue, English and French	…	-0.151 ***	…	…	…	…	…
Other mother tongue, French	…	-0.266 ***	…	…	…	…	…
Other mother tongue, English	…	-0.095 ***	…	…	…	…	…
French mother tongue	…	-0.186 ***	…	…	…	…	…
Listening (reference: 10 or more—advanced language ability, above initial)							
5—Intermediate language ability: initial	…	…	-0.391 ***	…	…	…	-0.119 ***
6—Intermediate language ability: developing	…	…	-0.369 ***	…	…	…	-0.105 ***
7—Intermediate language ability: adequate	…	…	-0.198 ***	…	…	…	-0.072 ***
8—Intermediate language ability: fluent	…	…	-0.101 ***	…	…	…	-0.029 ***
9—Advanced language ability: initial	…	…	-0.080 ***	…	…	…	-0.048 ***
Speaking (reference: 10 or more—advanced language ability, above initial)							
5—Intermediate language ability: initial	…	…	…	-0.422 ***	…	…	-0.179 ***
6—Intermediate language ability: developing	…	…	…	-0.382 ***	…	…	-0.187 ***
7—Intermediate language ability: adequate	…	…	…	-0.212 ***	…	…	-0.111 ***
8—Intermediate language ability: fluent	…	…	…	-0.120 ***	…	…	-0.058 ***
9—Advanced language ability: initial	…	…	…	-0.097 ***	…	…	-0.066 ***
Reading (reference: 10 or more—advanced language ability, above initial)							
4—Basic language ability: fluent	…	…	…	…	-0.447 ***	…	-0.210 ***
5—Intermediate language ability: initial	…	…	…	…	-0.485 ***	…	-0.251 ***
6—Intermediate language ability: developing	…	…	…	…	-0.446 ***	…	-0.259 ***
7—Intermediate language ability: adequate	…	…	…	…	-0.294 ***	…	-0.183 ***
8—Intermediate language ability: fluent	…	…	…	…	-0.192 ***	…	-0.116 ***
9—Advanced language ability: initial	…	…	…	…	-0.106 ***	…	-0.073 ***
Writing (reference: 10 or more—advanced language ability, above initial)							
4—Basic language ability: fluent	…	…	…	…	…	-0.413 ***	-0.086 **
5—Intermediate language ability: initial	…	…	…	…	…	-0.486 ***	-0.157 ***
6—Intermediate language ability: developing	…	…	…	…	…	-0.446 ***	-0.170 ***
7—Intermediate language ability: adequate	…	…	…	…	…	-0.243 ***	-0.106 ***
8—Intermediate language ability: fluent	…	…	…	…	…	-0.115 ***	-0.049 ***
9—Advanced language ability: initial	…	…	…	…	…	-0.071 ***	-0.050 ***

… not applicable

* significantly different from reference category (p < 0.05)

** significantly different from reference category (p < 0.01)

*** significantly different from reference category (p < 0.001)

Notes: Each model controls for landing year, years since landing, gender, months of school attendance and province of residence. The R-squared is 0.179 for Model 1, 0.180 for Model 2, 0.190 for Model 3, 0.190 for Model 4, 0.197 for Model 5, 0.193 for Model 6 and 0.203 for Model 7.

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

The mediating effects of official language skills

In Table 4, the differences in the model coefficients between Model 1, which did not control for a language variable, and the subsequent models with language variables indicate how a particular measure of official language ability mediates the effects of other key human capital factors.

Adding the self-reported language measure to the model barely changed the coefficients for age at immigration, pre-immigration Canadian work experience and education at immigration. These results suggest that the self-reported measure had little correlation with these key human capital factors. However, adding the self-reported language measure reduced the coefficients associated with some source regions where English or French is not as commonly used as in the United States (the reference

category) and Northern Europe. This reflects the fact that the self-reported language measure is strongly associated with source region, and thus the two variables had overlapping effects on earnings.

The inclusion of test-based language measures, particularly when the four dimensions were added together, reduced earnings disadvantages associated with most source regions relative to the United States, particularly for the Caribbean, Central and South America, and Asia, indicating that some of the differences across source regions were captured by the differences in the level of official languages across source regions.

The inclusion of test-based language measures tended to increase earnings differences by age at immigration and increase the earnings premium of pre-immigration Canadian work experience.

When each test-based language measure was added to the model, the earnings difference by education was reduced considerably, particularly when adding reading. When the four dimensions were added together, the earnings disadvantages associated with a high school education or less relative to a graduate degree disappeared. Thus, lower tested language skills accounted for the gap in initial earnings between EE immigrants with a high school diploma and those with a graduate degree. It is interesting to note that a one- or two-year postsecondary credential was associated with lower earnings than a high school diploma. Similarly, two or more postsecondary credentials were associated with lower earnings than a high school diploma.

When the four dimensions of official language skills were included in the model, the initial earnings differences between the FSWP and the other three admission programs were reduced—the extent of the decline ranged from two-thirds to the entire amount. As previously discussed, EE immigrants in the FSWP had higher levels of official language skills than immigrants in the other three programs, and this advantage accounted for their higher initial earnings than immigrants in other programs, holding other characteristics constant.

The effects of tested official language skills by admission program

Table 5 presents regression models for EE immigrants admitted through the FSWP. As mentioned earlier, the minimum language requirement for official language skills is CLB or NCLC level 7 for each dimension. Thus, the variation in official language skills among FSWP immigrants was limited. It is not surprising that each dimension of official language skills did not contribute much to account for the variation in earnings. However, the marginal effects of each dimension of official language skills were sizable. For instance, FSWP immigrants with CLB or NCLC level 7 reading skills earned 26% less (-0.305 log points) than their counterparts with level 10 or above reading skills in the reading model and 21% less in the models with all four dimensions. These marginal effects were similar in magnitude to those for all EE immigrants (Table 4).

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Table 5

Regression models showing the earnings effects of listening, speaking, reading and writing skills as categorical variables, principal applicants admitted through the Express Entry system, Federal Skilled Worker Program, 2015 to 2018 arrivals

	Model 1 Listening	Model 2 Speaking	Model 3 Reading	Model 4 Writing	Model 5 All four dimensions
			coefficient		
Listening (reference: 10 or more—advanced language ability, above initial)					
7—Intermediate language ability: adequate	-0.191 ***	…	…	…	-0.070 ***
8—Intermediate language ability: fluent	-0.116 ***	…	…	…	-0.057 **
9—Advanced language ability: initial	-0.058 ***	…	…	…	-0.037 ***
Speaking (reference: 10 or more—advanced language ability, above initial)					
7—Intermediate language ability: adequate	…	-0.243 ***	…	…	-0.151 ***
8—Intermediate language ability: fluent	…	-0.083 ***	…	…	-0.026
9—Advanced language ability: initial	…	-0.106 ***	…	…	-0.085 ***
Reading (reference: 10 or more—advanced language ability, above initial)					
7—Intermediate language ability: adequate	…	…	-0.305 ***	…	-0.240 ***
8—Intermediate language ability: fluent	…	…	-0.193 ***	…	-0.126 ***
9—Advanced language ability: initial	…	…	-0.109 ***	…	-0.071 ***
Writing (reference: 10 or more—advanced language ability, above initial)					
7—Intermediate language ability: adequate	…	…	…	-0.256 ***	-0.106 ***
8—Intermediate language ability: fluent	…	…	…	-0.100 ***	-0.026 *
9—Advanced language ability: initial	…	…	…	-0.086 ***	-0.066 ***
R-squared	0.190	0.192	0.193	0.192	0.197
Unique R-squared	0.003	0.004	0.005	0.004	0.010

… not applicable

* significantly different from reference category (p < 0.05)

** significantly different from reference category (p < 0.01)

*** significantly different from reference category (p < 0.001)

Notes: The number of observations is 56,765. Each model controls for landing year, years since landing, gender, age at immigration, years of pre-immigration Canadian work experience, education at immigration, source region, months of school attendance and province of residence. The unique R-squared is the increase in R-squared values from the model with a language measure to the model with a language measure.

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

Table 6 presents regression models for PNP immigrants admitted through the EE system. The variation in official language proficiency levels among PNP immigrants was larger than that among FSWP immigrants. The proficiency levels ranged from CLB or NCLC level 4 to level 10 or above, although fewer than 2% of PNP immigrants scored lower than level 6 in each of the four dimensions.[11] The language skill measures generally contributed more unique R-squared values to models predicting earnings among PNP immigrants than among FSWP immigrants and ranged from 0.008 for speaking to 0.011 for reading. The marginal effects associated with reading for PNP immigrants tended to be smaller than those estimated for all EE immigrants across levels 6 to 10 or above, while the marginal effects of the other three dimensions were similar for PNP and all EE immigrants.

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11. Not all PNP immigrants are admitted through the EE system. This study examines only PNP immigrants who have been selected through the EE system. There could be greater variation in the language proficiency if non-EE PNP immigrants were included in the study.

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Table 6

Regression models showing the earnings effects of listening, speaking, reading and writing skills as categorical variables, principal applicants admitted through the Express Entry system, Provincial Nominee Program, 2015 to 2018 arrivals

	Model 1 Listening	Model 2 Speaking	Model 3 Reading	Model 4 Writing	Model 5 All four dimensions
			coefficient		
Listening (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	-0.389 ***	…	…	…	-0.105 *
6—Intermediate language ability: developing	-0.380 ***	…	…	…	-0.155 ***
7—Intermediate language ability: adequate	-0.177 ***	…	…	…	-0.092 ***
8—Intermediate language ability: fluent	-0.089 ***	…	…	…	-0.047 **
9—Advanced language ability: initial	-0.068 ***	…	…	…	-0.051 ***
Speaking (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	…	-0.446 ***	…	…	-0.219 ***
6—Intermediate language ability: developing	…	-0.280 ***	…	…	-0.121 ***
7—Intermediate language ability: adequate	…	-0.195 ***	…	…	-0.124 ***
8—Intermediate language ability: fluent	…	-0.117 ***	…	…	-0.066 ***
9—Advanced language ability: initial	…	-0.082 ***	…	…	-0.050 ***
Reading (reference: 10 or more—advanced language ability, above initial)					
4—Basic language ability: fluent	…	…	-0.679 **	…	-0.358
5—Intermediate language ability: initial	…	…	-0.394 ***	…	-0.151 **
6—Intermediate language ability: developing	…	…	-0.351 ***	…	-0.170 ***
7—Intermediate language ability: adequate	…	…	-0.220 ***	…	-0.118 ***
8—Intermediate language ability: fluent	…	…	-0.139 ***	…	-0.062 ***
9—Advanced language ability: initial	…	…	-0.077 ***	…	-0.036 **
Writing (reference: 10 or more—advanced language ability, above initial)					
4—Basic language ability: fluent	…	…	…	-0.178	0.119
5—Intermediate language ability: initial	…	…	…	-0.450 ***	-0.176 ***
6—Intermediate language ability: developing	…	…	…	-0.395 ***	-0.185 ***
7—Intermediate language ability: adequate	…	…	…	-0.201 ***	-0.090 ***
8—Intermediate language ability: fluent	…	…	…	-0.124 ***	-0.062 ***
9—Advanced language ability: initial	…	…	…	-0.072 ***	-0.045 **
R-squared	0.171	0.170	0.173	0.172	0.180
Unique R-squared	0.009	0.008	0.011	0.010	0.018

… not applicable

* significantly different from reference category ($p < 0.05$)

** significantly different from reference category ($p < 0.01$)

*** significantly different from reference category ($p < 0.001$)

Notes: The number of observations is 30,064. Each model controls for landing year, years since landing, gender, age at immigration, years of pre-immigration Canadian work experience, education at immigration, source region, months of school attendance and province of residence.
Source: Statistics Canada, Longitudinal Immigration Database, 2020.

Table 7 presents regression models for CEC immigrants. The minimum language requirement for CEC immigrants was CLB or NCLC level 5, and between 8% (in listening) and 14% (in reading and writing) of CEC immigrants had level 5 or level 6 language skills. The unique R-squared associated with each dimension of official language skills ranged from 0.017 for speaking to 0.030 for reading. The marginal effects of each dimension were similar to those estimated for all EE immigrants (Table 4).

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Table 7

Regression models showing the earnings effects of listening, speaking, reading and writing skills as categorical variables, principal applicants admitted through the Express Entry system, Canadian Experience Class, 2015 to 2018 arrivals

	Model 1 Listening	Model 2 Speaking	Model 3 Reading	Model 4 Writing	Model 5 All four dimensions
			coefficient		
Listening (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	-0.417 ***	…	…	…	-0.124 ***
6—Intermediate language ability: developing	-0.392 ***	…	…	…	-0.117 ***
7—Intermediate language ability: adequate	-0.221 ***	…	…	…	-0.080 ***
8—Intermediate language ability: fluent	-0.121 ***	…	…	…	-0.035 ***
9—Advanced language ability: initial	-0.108 ***	…	…	…	-0.056 ***
Speaking (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	…	-0.467 ***	…	…	-0.191 ***
6—Intermediate language ability: developing	…	-0.398 ***	…	…	-0.191 ***
7—Intermediate language ability: adequate	…	-0.210 ***	…	…	-0.096 ***
8—Intermediate language ability: fluent	…	-0.135 ***	…	…	-0.066 ***
9—Advanced language ability: initial	…	-0.096 ***	…	…	-0.051 ***
Reading (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	…	…	-0.522 ***	…	-0.271 ***
6—Intermediate language ability: developing	…	…	-0.477 ***	…	-0.277 ***
7—Intermediate language ability: adequate	…	…	-0.323 ***	…	-0.195 ***
8—Intermediate language ability: fluent	…	…	-0.220 ***	…	-0.134 ***
9—Advanced language ability: initial	…	…	-0.124 ***	…	-0.082 ***
Writing (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	…	…	…	-0.514 ***	-0.162 ***
6—Intermediate language ability: developing	…	…	…	-0.461 ***	-0.174 ***
7—Intermediate language ability: adequate	…	…	…	-0.266 ***	-0.120 ***
8—Intermediate language ability: fluent	…	…	…	-0.132 ***	-0.064 ***
9—Advanced language ability: initial	…	…	…	-0.051 ***	-0.025 **
R-squared	0.211	0.210	0.222	0.216	0.231
Unique R-squared	0.018	0.017	0.030	0.024	0.039

… not applicable

** significantly different from reference category ($p < 0.01$)

*** significantly different from reference category ($p < 0.001$)

Notes: The number of observations is 78,464. Each model controls for landing year, years since landing, gender, age at immigration, years of pre-immigration Canadian work experience, education at immigration, source region, months of school attendance and province of residence.

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

Table 8 presents regression models for FSTP immigrants. The minimum language requirement for the FSTP was CLB or NCLC level 5 for listening and speaking and level 4 for reading and writing. About half of FSTP immigrants had listening and speaking skills at levels 5 or 6, and two-thirds had reading and writing skills from levels 4 to 6. The unique R-squared associated with each dimension of official language skills was small, ranging from 0.001 for speaking to 0.003 for listening. There were no clear earnings gradients associated with each dimension of official language skills among FSTP immigrants. It seems that differences in tested language levels made little difference among the admitted PAs who met the minimum language requirement of the FSTP.

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Official language proficiency and immigrant labour market outcomes:
Evidence from test-based multidimensional measures of language skills

Table 8

Regression models showing the earnings effects of listening, speaking, reading and writing skills as categorical variables, principal applicants admitted through the Express Entry system, Federal Skilled Trades Program, 2015 to 2018 arrivals

	Model 1 Listening	Model 2 Speaking	Model 3 Reading	Model 4 Writing	Model 5 All four dimensions
			coefficient		
Listening (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	-0.134 ***	…	…	…	-0.128 ***
6—Intermediate language ability: developing	-0.096 **	…	…	…	-0.089 *
7—Intermediate language ability: adequate	-0.132 ***	…	…	…	-0.126 ***
8—Intermediate language ability: fluent	-0.134 ***	…	…	…	-0.131 ***
9—Advanced language ability: initial	-0.030	…	…	…	-0.001
Speaking (reference: 10 or more—advanced language ability, above initial)					
5—Intermediate language ability: initial	…	-0.080 *	…	…	-0.092 *
6—Intermediate language ability: developing	…	-0.107 **	…	…	-0.125 **
7—Intermediate language ability: adequate	…	-0.088 *	…	…	-0.105 **
8—Intermediate language ability: fluent	…	-0.095 *	…	…	-0.111 **
9—Advanced language ability: initial	…	-0.105 **	…	…	-0.106 **
Reading (reference: 10 or more—advanced language ability, above initial)					
4—Basic language ability: fluent	…	…	-0.167 ***	…	-0.143 **
5—Intermediate language ability: initial	…	…	-0.133 ***	…	-0.116 **
6—Intermediate language ability: developing	…	…	-0.119 ***	…	-0.091 *
7—Intermediate language ability: adequate	…	…	-0.084 *	…	-0.055
8—Intermediate language ability: fluent	…	…	-0.130 **	…	-0.094 *
9—Advanced language ability: initial	…	…	-0.136 ***	…	-0.121 **
Writing (reference: 10 or more—advanced language ability, above initial)					
4—Basic language ability: fluent	…	…	…	0.026	0.166 **
5—Intermediate language ability: initial	…	…	…	-0.031	0.100
6—Intermediate language ability: developing	…	…	…	-0.013	0.097
7—Intermediate language ability: adequate	…	…	…	0.006	0.083
8—Intermediate language ability: fluent	…	…	…	-0.029	0.018
9—Advanced language ability: initial	…	…	…	-0.172	-0.143 *
R-squared	0.232	0.230	0.232	0.231	0.239
Unique R-squared	0.003	0.001	0.003	0.002	0.010

… not applicable

* significantly different from reference category ($p < 0.05$)

** significantly different from reference category ($p < 0.01$)

*** significantly different from reference category ($p < 0.001$)

Notes: The number of observations is 6,987. Each model controls for landing year, years since landing, gender, age at immigration, years of pre-immigration Canadian work experience, education at immigration, source region, months of school attendance and province of residence.

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

In short, the four dimensions of official language skills had a relatively large unique R-squared value for the CEC (3.9%), while the values were small for the FSWP (1.0%), FSTP (1.0%) and PNP (1.8%). For the CEC and the FSWP, reading had the largest marginal effects. For the PNP, the effects of the four dimensions of official language skills were all significant and of similar size. For the FSTP, there were no consistent patterns in the marginal effects of the four dimensions of official language skills.

Conclusion and discussion

The EE system, introduced in 2015, uses the CRS to rank principal applicants (PAs) under the FSWP, CEC, FSTP and a portion of the PNP and determine their eligibility for immigration. Proficiency in the official languages is one of the key factors in the CRS grid. Language points are allocated for each CLB or NCLC (for French) level from the minimum levels required by each immigration program up to CLB (or

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NCLC) level 10 or above along the four dimensions of proficiency: listening, speaking, reading and writing.

Since an objective measure of language proficiency was not available, the analytical report that served as the empirical evidence for the design of the CRS used a language measure based on self-reported knowledge of official languages and mother tongue to estimate the effect of official language proficiency on earnings (Bonikowska, Hou & Picot, 2015). As a result, the effect of official language ability might be underestimated. This study examines how the test-based language proficiency measures in the four dimensions predict labour market outcomes among selected immigrants. The results are informative for the selection of economic immigrants for labour market success.

The results of the analysis indicate that the test-based language measures had very small predictive power for the incidence of employment; there was little difference in the initial incidence of employment among EE immigrants by the four dimensions of official language skills. The self-reported measure of language had even smaller effects.

The analysis of earnings, however, shows that all four measures of language proficiency together explained 4.4% of the total variation in earnings, independent of other key immigrant selection criteria, much more than what could be explained by the self-reported measure. Even individually, each of the four dimensions of the test-based language proficiency measures explained more of the variation in earnings than the self-reported measure. These results suggest that using self-reported language measures, typically based on knowledge of official languages and mother tongue, can lead to considerable underestimation of the language effect.

Compared with other human capital factors, the tested official language skills were as important as pre-immigration Canadian work experience and much more important than the educational level and age at immigration in predicting earnings in the initial years after immigration.

Concerning the relative importance of the four dimensions of tested official language skills in explaining earnings, the study shows that reading tended to have the largest contribution in explaining the variation in earnings and the largest marginal effects, but the differences across the four proficiency dimensions were generally small. All four dimensions had a significant independent positive effect on earnings. Earnings differentials across test-based proficiency levels in all four dimensions are considerable. For example, when only the reading skill was examined along with all control variables, immigrants with level 7 skills (intermediate language ability: adequate) earned about 25% less than those with skills of level 10 or above (advanced language ability: above initial). In comparison, the corresponding earnings differences for listening, speaking and writing were 18%, 19% and 22%, respectively.

The estimated earnings differentials by educational level, admission program and source region were larger when the self-reported language indicator was used in the estimation than when a test-based measure was included instead. When the four dimensions of test-based language proficiency measures were included in the model, EE immigrants with a graduate degree earned no more than those with either a high school or less education or a bachelor's degree. An important finding related to education was that a one- or two-year postsecondary credential was associated with lower earnings than a high school diploma, even though the former is assigned three times more points in the CRS. Similarly, two or more postsecondary educational credentials were associated with lower earnings than a high school diploma, even though the former is assigned slightly more points than a bachelor's degree in the CRS. These results seem to suggest that a more standard educational credential (i.e., a high school diploma or a bachelor's degree) is rewarded better in terms of earnings than educational credentials that are less uniformly defined and may vary considerably across source countries (i.e., a one- or two-year postsecondary credential, or two or more postsecondary educational credentials).

Including language indicators in the estimation reduces the effect of source region, indicating that some of the differences across source regions could be explained by the differences in the level of official languages across source regions. Alternatively, both self-reported and test-based language measures explained more variation in earnings in models that did not control for immigrant source region than in models controlling for source region. This suggests that both self-reported and test-based language measures can capture some of the effect of source region on earnings if source region is not controlled for (in the current CRS, source region is not part of the selection criteria).

When all selected covariates except test-based language indicators were controlled for, there were large earnings differences across immigration admission programs, but when the four dimensions of official language skills were added in the models, the earnings differences between the FSWP and PNP, CEC or FSTP were reduced by two-thirds or entirely. This suggests that much of the observed differences in initial earnings across immigration programs can be accounted for by the difference in language skills among selected economic PAs admitted through different programs.

Although the minimum language requirements differ by admission program, the marginal effects of each dimension of the four official language skills were broadly similar for FSWP, PNP and CEC immigrants. However, there were no clear earnings gradients associated with each dimension of official language skills among immigrants who meet the minimum language requirement and were admitted through the FSTP. This finding is consistent with an earlier study that found that the earnings return to official language ability was much lower among immigrants in the skilled trades than among other economic immigrants (Hou, et al., 2021).

It is important to note that the tested language proficiency levels in the data are top coded at level 10 and above. This may reduce the power of language skills in accounting for the variation in earnings among immigrants in this study. It is also important to reiterate that the study looked only at economic PAs admitted through the EE system. The minimum language requirements of the economic programs screen out applicants who have poor English or French ability. Hence, the heterogeneity in language ability of immigrants in this study is smaller than that of immigrants in general. Therefore, the results of this study apply only to PAs admitted through the EE system and may not be applicable to immigrants in general. In addition, the study only examined the employment and earnings outcomes in the initial years (one to four years) after immigration. The power of the language proficiency measures in predicting these outcomes may change in the medium and long term, and this will be seen when data are available in the next 5 to 10 years.

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Appendix Table 1

Distribution of official language skill levels among principal applicants admitted through the Express Entry system by admission program, 2015 to 2018 arrivals

	Listening	Speaking	Reading	Writing
		percent		
Official language level				
Federal Skilled Worker Program				
7—Intermediate language ability: adequate	3.9	2.7	1.8	3.9
8—Intermediate language ability: fluent	3.4	4.0	2.7	7.1
9—Advanced language ability: initial	23.0	23.2	27.1	44.5
10 or more—Advanced language ability: above initial	69.8	70.2	68.5	44.6
Provincial Nominee Program				
4—Basic language ability: fluent	…	…	0.1	0.0
5—Intermediate language ability: initial	1.4	1.7	1.4	1.5
6—Intermediate language ability: developing	2.8	3.9	5.0	5.2
7—Intermediate language ability: adequate	31.7	16.4	12.9	26.6
8—Intermediate language ability: fluent	17.6	20.3	16.0	29.9
9—Advanced language ability: initial	15.5	22.1	29.32	20.7
10 or more—Advanced language ability: above initial	30.9	35.7	35.4	16.1
Canadian Experience Class				
5—Intermediate language ability: initial	2.5	3.1	3.7	3.2
6—Intermediate language ability: developing	3.4	5.2	5.6	6.4
7—Intermediate language ability: adequate	20.4	14.2	8.9	23.2
8—Intermediate language ability: fluent	15.6	17.7	11.8	29.0
9—Advanced language ability: initial	14.4	17.2	22.2	18.3
10 or more—Advanced language ability: above initial	43.7	42.6	47.8	19.9
Federal Skilled Trades Program				
4—Basic language ability: fluent	…	…	18.3	13.8
5—Intermediate language ability: initial	29.2	27.8	24.9	25.2
6—Intermediate language ability: developing	23.5	26.3	25.1	28.2
7—Intermediate language ability: adequate	22.5	17.3	10.0	17.4
8—Intermediate language ability: fluent	7.8	10.2	6.6	8.8
9—Advanced language ability: initial	4.7	6.5	7.4	3.1
10 or more—Advanced language ability: above initial	12.3	12.0	7.8	3.6

… not applicable

Source: Statistics Canada, Longitudinal Immigration Database, 2020.

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