THE IMPACT OF ENGLISH-FRENCH BILINGUALISM ON WAGES IN CANADA

by

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ABSTRACT

Although several studies have claimed to provide evidence of a wage premium for English-French bilingual Canadians, so far only one study by Christofides and Swidinsky (2010) has distinguished between the effects of language *knowledge* and language *use* on wages. This study addresses this gap by analyzing the impact of English-French bilingualism on wages in Canada using data from the 2011 National Household Survey. The results suggest that in Quebec, employers value bilingualism regardless of whether both languages are used at work, with wage premiums ranging from 4.4 to 33.4 percent depending on gender and language use. Outside of Quebec, once occupation and industry are controlled for, no evidence is found that a wage premium exists for bilingual men, however bilingual women appear to receive a 6.2 to 13.4 percent premium if they actually use both languages at work, depending on which of the two languages is used most often.

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LIST OF SYMBOLS, NOMENCLATURE OR ABBREVIATIONS

English or Anglophone: People whose mother tongue is considered to be English

French or Francophone: People whose mother tongue is considered to be French

Mother tongue: The first language an individual learns and speaks during their childhood

1. INTRODUCTION

It is well established that English-French bilingualism within Canada can provide many cultural, societal, and personal benefits. However, whether or not it directly contributes to higher wages is still the subject of debate. Bilingualism could potentially be associated with higher earnings either because of its actual value in the workplace, or simply because it signals unobservable but desirable traits to employers. Either way, it is important to understand the returns to bilingualism given the time investment and costs often associated with learning a second language. While several studies have claimed to provide evidence of a statistically significant wage premium for bilingual workers, others have argued that the relationship between bilingualism and earnings is frail. To further complicate the issue, relatively little research has been published on this topic in recent years and only one study by Christofides and Swidinsky (2010) has distinguished between the effects of language knowledge and actual language use on wages.

This report aims to serve two purposes: first, to provide a more recent analysis of the impact of bilingualism on wages; and second, to build on the work by Christofides and Swidinsky (2010) on distinguishing between the impacts of language knowledge and language use. The 2011 National Household Survey data used in this report allows for both of these goals to be met, as it contains the most recent information on language knowledge and actual language use in the workplace. Using the standard ordinary least squares (OLS) log earnings equation in order to derive estimates for the impact of bilingualism on labour market earnings, this study finds strong evidence for the existence of wage premiums for bilingualism in Quebec, and mixed evidence for Canada outside

Quebec.

The structure of this report is as follows. Chapter 2 contains a background of bilingualism in Canada, and a review of the existing literature on bilingualism and wages. Chapter 3 begins with a description of the data, followed by a discussion of the model and variables. Chapter 4 presents descriptive statistics and contains the results of the study, while Chapter 5 focuses on a discussion of the results. Finally, Chapter 6 contains both a brief summary of the important findings and concluding thoughts.

2. BACKGROUND AND LITERATURE REVIEW

2.1 The Scope of English-French Bilingualism in Canada

Every Canadian census since 1901 has included at least one question on language. As Table 1 below shows, the first ever recorded bilingualism rates were 14.7% for Canada, 32.9% for Quebec, and 6.9% for Canada excluding Quebec in 1901. These rates all showed a general downward trend through 1941 to lows of 12.4% for Canada, 27.9% for Quebec, and 6.4% for Canada excluding Quebec, which may be largely explained by the strong growth in international immigration during this time period (Houle & Lepage, 2016). By 1951 the pattern reversed, however, and bilingualism rates began climbing, aided by the implementation of the first *Official Languages Act* in 1969, the adoption of French immersion programs across the country, and growing recognition of the value of bilingualism. As of 2011, bilingualism rates were 18.3% for Canada, 44.6% for Quebec, and 10.2% for Canada excluding Quebec.

In recent years, Quebec's bilingualism rate has been increasing much faster than that of Canada's outside Quebec, which now appears to be stabilizing between 10 and 11%. Houle and Lepage (2016) hypothesize that the lack of growth in the bilingualism rate outside of Quebec between 2001 and 2011 was due to international immigration. During this time, immigration was the leading contributor to population growth in Canada at roughly 250,000 individuals annually, most with mother tongues other than French or English, and less than 6% with knowledge of both official languages. Overall, however, the bilingual population in Canada has increased from roughly 650,000 individuals in 1901 to over 5 million individuals in 2011 (Houle & Lepage, 2016).

Table 1- Percentage of the population aged 5 years and older who reported being able to speak English and French, Canada, Quebec and Canada excluding Quebec, 1901 to 2011

Year	Canada	Quebec	Canada excluding Quebec
1901	14.7	32.9	6.9
1921	15.1	34.7	8.1
1931	14.0	33.4	6.9
1941	12.4	27.9	6.4
1951	13.7	29.2	7.5
1961	13.7	28.9	7.6
1971	14.4	29.6	8.5
1981	16.3	34.6	9.7
1986	17.2	36.6	10.5
1991	17.3	37.5	10.4
1996	17.9	39.9	10.7
2001	18.5	42.6	10.8
2006	18.2	42.3	10.7
2011	18.3	44.6	10.2

Source: Censuses of Canada, 1901 to 2011. From Houle, R., & Lepage, J.-F. 2016 "The evolution of English–French bilingualism in Canada from 1901 to 2011." Canadian Megatrends, Statistics Canada.

Table 2 below shows the most recent figures from the 2011 Census on the number of bilingual individuals in Canada by province and territory. While Canada currently has approximately 5.8 million bilingual individuals, the majority reside in Quebec (3.3 million) and Ontario (1.3 million).

Table 2- Population by knowledge of official language, by province and territory (2011 Census)

	Total	English only	French only	Both English and French	Neither English nor French
	number of individuals				
Canada	33,121,175	22,564,665	4,165,015	5,795,575	595,920
Newfoundland and Labrador	509,950	485,740	135	23,450	625
Prince Edward Island	138,435	120,590	130	17,005	715
Nova Scotia	910,615	814,670	875	93,435	1,635
New Brunswick	739,900	426,675	66,380	245,885	955
Quebec	7,815,955	363,860	4,047,175	3,328,725	76,195
Ontario	12,722,065	10,984,360	42,980	1,395,805	298,920
Manitoba	1,193,095	1,074,335	1,490	103,145	14,135
Saskatchewan	1,018,310	965,925	430	46,570	5,395
Alberta	3,610,185	3,321,815	3,205	235,565	49,600
British Columbia	4,356,205	3,912,955	2,050	296,645	144,560
Yukon	33,655	29,050	90	4,420	95
Northwest Territories	41,040	37,045	45	3,720	235
Nunavut	31,765	27,665	35	1,200	2,860

Source: Statistics Canada, 2011 Census of Population. From "Population by knowledge of official language, by province and territory (2011 Census)." Last modified February 13, 2013. http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo15-eng.htm.

In Table 2, it is also apparent that a significant proportion of the population has no knowledge of either French or English. Indeed, in all provinces and territories except Quebec and New Brunswick, the number of individuals with knowledge of neither English or French exceeds the number of individuals who know French only.

2.2 Mandatory English-French Bilingualism in the Canadian Workplace

Given shifts in bilingualism rates, English-French bilinguals represent a significant and growing portion of the Canadian population, and are therefore well-represented within the Canadian workforce. While not all bilinguals will use both official languages in the workplace, many jobs across the country do have a bilingualism requirement. Beginning with the federal government, the *Official Languages Act* recognizes the equal status of both French and English throughout the federal administration, and ensures that all Canadian citizens have access to federal services in whichever official language they prefer. As a result, many positions within the federal government, and many contractors working at the federal level, have a bilingualism requirement, especially if they involve interaction with the public. As such, it is common to find bilinguals working at this level of government. A 2009 parliamentary committee study found that of the almost 180,000 positions on record with the Canada Public Service Agency for 2006-2007, over 72,000 were designated bilingual (Standing Committee on Official Languages, 2009).

At the provincial government level, mandatory English-French bilingualism is limited to certain regions and departments. New Brunswick is Canada's only officially bilingual province, so it has the only provincial government that follows the same guidelines as the federal government - that is, while not all roles require bilingualism, government services must be able to be provided in the official language of a person's choosing. In addition, any private company providing services on behalf of the New Brunswick government must also be able to do so in either English or French (Office of the Commissioner of Official Languages for New Brunswick, 2016).

In other provinces, provincial government is largely unilingual, with French being the default in Quebec and English being the default in all other provinces. However, mandatory bilingualism is still found in certain departments of provincial governments, and the Acadian Affairs division of Nova Scotia's Department of Communities, Culture and Heritage is one such example (Acadian Affairs, 2016). Mandatory bilingualism in provincial governments can also be found in certain areas if there is a large enough demand, as is the case in the National Capital Region. Similar to the guidelines for provincial governments outside of New Brunswick, mandatory bilingualism can be found within municipal governments depending on the specific region, its population, and the language or languages that population speaks.

Finally, within the private sector, mandatory English-French bilingualism varies largely depending on the company and its size, location, and function. The Official Languages Act does not apply to provincial or municipal governments, or private businesses and non-profit organizations. As such, Canadian businesses have no legislated language obligations as long as they are not providing services on behalf of the federal government (OCOL, 2016).

2.3 Wage Premiums and Bilingualism

There is mixed evidence for the existence of a wage premium for bilinguals in the existing literature. In an attempt to fairly represent the previous work and research on the topic, this section considers the findings of a wide variety of studies performed in Canada, the United States, and European countries over the past 20 years.

In Wales, Henley and Jones (2005) find that women able to write, read, speak,

and understand both Welsh and English enjoy a 12.4 percent earnings premium, even while controlling for human capital and demographic characteristics. Interestingly, however, they find no evidence to suggest that that ability to use a second language in the workplace is behind the enhanced earnings, which would support the theory that some bilinguals may experience higher wages due to the unobserved human capital characteristics associated with bilingualism. While it should be noted that they found no statistically significant bilingual earnings premium for men in Wales, this is not unusual.

Williams (2011) finds no return to second language usage for men in Belgium, Ireland, or Luxembourg, where bilingual women are all once again found to experience wage premiums. The author suggests that gender differences in occupational distributions may be responsible for these findings, though it is not entirely clear how. In France, Italy, and Spain, the return to bilingualism is only found to be statistically significant for men. Overall, on average it appears that the use of a second language in the workplace leads to an earnings premium of 3 to 5 percent across several European countries, with this premium being statistically significant predominately in professional and managerial occupations (Williams, 2011).

There has been much debate on the topic of bilingualism and earnings in the United States in recent years, with research arguing both for the existence of a bilingual wage premium and against it. Saiz and Zoido (2005) find a 2 to 3 percent wage premium for college graduates able to speak both English and any foreign language when compared to monolingual English college graduates, even when controls for cognitive ability are included. Fry and Lowell (2003), however, find no statistically significant return to bilingualism when controlling for education, and suggest that even if bilinguals

experience higher nominal wages, the ability to speak an additional foreign language does not contribute directly to higher wages once human capital characteristics are held constant.

To date, three studies have been published on the returns to bilingualism for nurses in the United States. Kalist (2005) suggests that some employers may offer wage premiums to attract nurses that speak both English and Spanish, in order to better serve patients, meet government requirements, and limit legal liability. Seemingly supporting this hypothesis, the author finds wage premiums of up to 7 percent for bilingual nurses depending on the proportion of Spanish individuals in the surrounding area. Coombs and Cebula (2010) directly challenge these findings however, and argue that the supposed positive bilingual-earnings effect is due to an omitted variable bias. In their study, they find no evidence of a wage premium after adding more detailed controls to the original model to represent the differences in nursing functions. Finally, Coomer (2011) analyzes the nursing market in the United States, and suggests that bilingual nurses able to speak both English and any other language may earn higher wages either because of increased demand for bilingual workers, or simply because bilingualism is a sign of innate ability or skill to employers. In this third and most recent study in the field of nursing, the author does find a small wage premium for bilingual registered nurses, appearing to be due primarily to bilingualism's use as a signal to employers.

Naturally, much of the research on bilingualism and earnings has been done in Canada given its two official languages, the availability of data on both monolingual and bilingual workers, and the interest of the Canadian population on the subject. While certainly not all of the attention given to bilingualism in Canada is positive, there is still

interest in uncovering the actual benefits to learning and using both official languages in this country. For example, many parents still face the decision of whether to enroll their children in second language immersion programs, and often workers will question whether second language skills could provide them with better opportunities in the workplace. Given that French is the more common language in Quebec with English being more common throughout the rest of Canada, there has also been a focus on examining first and second languages and earnings depending on region of the country.

Shapiro and Stelcner (1997) consider language and earnings in Quebec from 1970 to 1990, and note the tensions over language within the province. They find evidence of a wage premium for francophones able to speak English, with the returns to language being tied to employment status. That is, bilingualism is better-rewarded among part-time workers than full-time workers in Quebec. In this study, unilingual anglophones who work part-time fare the worst of any language and employment group in Quebec, suggesting those individuals would have a strong incentive to learn French as a second language. Given Canada's bilingualism requirements in the public sector, some researchers have chosen to focus on comparing wage premiums between the country's public and private sectors. Christofides and Swidinsky (2006) find the bilingual wage premium for both men and women to be higher in the public sector than in the private sector, likely due to the demand for bilingualism in the public sector generated by the Official Languages Act. In the private sector the bilingualism premium is around 2 percentage points, while in the public sector it varies between 5.2 and 8.1 percentage points for men and 3.8 to 7.3 percentage points for women. The authors hypothesize that the lower bilingualism premium experienced by women reflects the fact that bilingualism

is more common among women than men in Canada.

The most relevant research on the topic of bilingualism and earnings in Canada is by Christofides and Swidinsky (2010) who are the first to distinguish between the effects of language knowledge and use on wages. This report attempts to build on their study, and so a greater focus is placed on analyzing their procedure and findings. First, using 2001 Census data they identify individuals based on their official language knowledge status and their languages used at work. This allows them to compare the earnings of monolingual and bilingual Canadians using only their mother tongue at work, and bilingual Canadians using both official languages at work. The return to second-language *knowledge* is represented by the difference found between the earnings of bilinguals and monolinguals using only their mother tongue at work, while the return to second-language *use* is represented by the difference found between the earnings of bilinguals using both official languages at work and bilinguals only using their mother tongue at work. Interestingly, the authors find that outside of Quebec, the majority of the wage premium experienced by anglophones with French second-language skills is driven simply by language knowledge and not actual use. This supports the long-standing theory that language skills signal unobservable but desirable characteristics to employers such as ability or perseverance. In Quebec, however, where English second-language skills could be highly valuable to businesses dealing with other provinces or countries, a more substantial portion of the wage premium experienced by bilinguals is associated with actual language use in the workplace. Therefore, in Quebec, in order to fully experience the benefits of bilingualism it appears that francophone men and women must be actively using English for market-related activities. The bilingualism premium for francophones

in Quebec starts at around 7 to 8 percentage points simply for language knowledge, and increases by several more percentage points with actual language use in the workplace.

While not the main focus of this report, there is a large body of literature on bilingualism, dedicated to the non-monetary benefits of speaking more than one language. This research is worth mentioning here as it helps explain why employers may value bilingualism in their employees, even if the second language is never used in the workplace. In brief, there is significant evidence that bilinguals of all ages and nearly all stages of learning and fluency experience cognitive benefits as a result of their second language training. Bialystok (1999) finds that selective attention, otherwise known as control, develops earlier in bilingual children than in their comparable monolingual peers. Benefits have also been found for children enrolled in a second-language immersion program for three or more years, with evidence suggesting they have faster reaction times on tasks involving attention and mental flexibility than non-enrolled children (Nicolay & Poncelet, 2013). Young bilingual adults have been shown to possess faster reaction times on these same tasks when compared with monolinguals as well, and are said to be better at resolving conflicting information (Costa, Hernández, & Sebastián-Gallés, 2008). Lastly, there is evidence suggesting that bilingualism helps to offset age-related losses in executive processes (Bialystok, Craik, Klein, & Viswanathan, 2004) and can help individuals cope with Alzheimer's disease by delaying the onset of its most severe symptoms (Bialystok, 2011). As a final note, it is important to consider that bilingualism provides a wide range of social and cultural opportunities in Canada, and that language policies within the country are rarely, if ever, purely motivated by concerns about productive efficiency (Armstrong, 2015).

3. DATA, SAMPLE, MODEL, AND VARIABLES

3.1 Data and Sample

This study uses data obtained from the 2011 National Household Survey (NHS) Public Use Microdata File (PUMF). The NHS was a voluntary and self-administered survey conducted by Statistics Canada, meant to replace the long-form census questionnaire. It was given to 4.5 million households in the spring of 2011, and had a final national-level response rate of 68.6% (Statistics Canada, 2011). The 2011 NHS data is particularly useful for this study as, along with the usual socioeconomic variables for wages, education, employment and so on, it contains variables on knowledge of official languages, mother tongue, and language of work. Furthermore, the population weights included with the NHS data allow for the calculation of results representative of the Canadian population.

The working sample in this study only retains observations for individuals between the ages of 18 and 64 that have at least a high school education, are Canadian born, and reported working full-time, full-year as a paid employee in 2010. This is done to ensure that individuals in the working sample are somewhat homogeneous, and is consistent with the restrictions imposed by Christofides and Swidinsky (2010) on their working sample. Furthermore, once again following Christofides and Swidinsky (2010) the working sample is split into two groups, one for Quebec and one for Canada excluding Quebec. In Quebec, individuals are only retained in the sample if their mother tongue is French, and they report being fluent either only in French or both in English and French. Similarly, individuals in Canada excluding Quebec are only retained if their

mother tongue is English, and they report fluency either only in English or in both English and French. Whether an individual is able to speak a foreign language does not impact their status as either monolingual (English or French) or bilingual for this study, as only official languages are being considered.

3.2 Model

In accordance with the existing research on the topic, this study uses the standard ordinary least squares (OLS) log earnings equation in order to derive estimates for the impact of bilingualism on labour market earnings. The equation is as follows:

$$lnWages = \alpha + \beta X + \gamma Z + \varepsilon$$

where *lnWages* is the natural logarithm of annual wages and salaries before deductions, α is the intercept, β is the set of coefficients on the language variables represented by X, γ is the set of coefficients on the control variables represented by Z, and ε is the error term. For both the Quebec and Canada excluding Quebec samples, the regression is run two times each for men and women, with the only difference between the first and second run being the exclusion, and then inclusion, of variables for occupation and sector. This is again consistent with the research by Christofides and Swidinsky (2010), who suggest that this procedure allows for the differentiation between intra-industry and inter-industry earnings effects of second language skills.

3.3 Variables

The dependent variable in each instance is the natural logarithm of the gross wages and salaries earned by a given individual during the 2010 calendar year, before any deductions for items such as income tax, pensions, or Employment Insurance. Both

the models for Quebec and Canada excluding Quebec include control variables for marital status (single, common law, married, and divorced, separated or widowed), highest level of education obtained (high school, trade certificate or college, undergraduate degree, and graduate degree), and years of potential labour market experience. The 2011 NHS does not provide information on actual years of labour market experience, so for this study years of potential experience has been calculated by subtracting total years of education plus five years from age. Control variables for region are included in the model for Canada excluding Quebec, and are defined as Ontario, Atlantic (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick), Prairie (Manitoba and Saskatchewan), and the West (Alberta and British Columbia), with Northern Canada being excluded. Finally, the second regression in each scenario includes control variables for both occupation and industry. The occupation variables are based on the National Occupational Classification for Statistics (NOC-S) and include categories for management, business, sciences, health, education, art, sales, trades, primary industry, and manufacturing. Industry variables are based on groups of industry sectors from the North American Industry Classification (NAICS) 2007 and are labeled as construction (agriculture, forestry, fishing and hunting, mining, quarrying, and oil and gas extraction, utilities, construction, manufacturing, and transportation and warehousing), trade (both wholesale and retail), financial (finance and insurance/ management of companies, real estate and rental and leasing, professional, scientific and technical services, administrative and support, waste management and remediation services), government, education and health, and accommodation (accommodation and food services, other services, arts, entertainment and recreation, and information and

cultural industries).

The language variables created for this study are shown in Table 3 below:

Table 3- Language variables

Language Group	**Variable Name**
Unilingual English (Canada excluding Quebec only, reference group)	UnilENGLISH
Unilingual French (Quebec only, reference group)	UnilFRENCH
Bilingual, using only English in the workplace	BilMENO
Bilingual, mostly using English in the workplace but frequently using French as well	BilMEFF
Bilingual, using only French in the workplace	BilMFNO
Bilingual, mostly using French in the workplace but frequently using English as well	BilMFFE

For Canada excluding Quebec the reference group includes those who speak English only, while for Quebec the reference group includes those who speak French only. Both models contain four other variables for bilinguals depending on their language use in the workplace. BilMENO and BilMFNO represent those who are bilingual but only speak English or French in the workplace, respectively. BilMEFF represents bilingual individuals who mainly speak English in the workplace but frequently use French. Finally, BilMFFE represents bilingual individuals who primarily speak French in the workplace but frequently use English.

The next chapter contains descriptive statistics for the variables used in this study, as well as regression results for both Quebec and Canada excluding Quebec.

4. ANALYSIS OF BILINGUAL WAGE PREMIUMS

4.1 Descriptive Statistics

Table 4 below shows the weighted N values and distributions for variables included in the Quebec model. In general, men and women show similar distributions in marital status and schooling, with the most variation occurring between the occupation and industry groups. A higher percentage of bilingual men than women in Quebec mostly use French in the workplace and frequently use English, and overall bilingualism itself is more common among men with 59.2 percent being considered bilingual, compared to 49.5 percent of women.

Table 4- Selected Descriptive Statistics for Men and Women in Quebec

	Men		Women	
	Weighted N	**Percentage**	**Weighted N**	**Percentage**
Total	**542,516**	**100%**	**555,132**	**100%**
Marital Status				
Single	129,550	23.9%	118,717	21.4%
Common-Law	205,546	37.9%	214,196	38.6%
Married	171,387	31.6%	164,340	29.6%
Divorced/Separated /Widowed	36,033	6.6%	57,879	10.4%
Schooling				
High School	116,264	21.4%	114,113	20.6%
Trade/College	289,908	53.4%	273,541	49.3%
Undergraduate	106,354	19.6%	136,032	24.5%
Graduate	29,990	5.5%	31,446	5.7%
Language				
UnilFRENCH	221,481	40.8%	280,170	50.5%
BilMFNO	148,189	27.3%	139,448	25.1%
BilMFFE	147,124	27.1%	114,884	20.7%
BilMENO	5,078	0.9%	3,721	0.7%
BilMEFF	20,644	3.8%	16,909	3.0%
Occupation				
Trades	114,481	21.1%	6,972	1.3%
Management	71,384	13.2%	55,395	10.0%
Business	69,406	12.8%	189,131	34.1%
Sciences	84,415	15.6%	24,580	4.4%
Health	13,187	2.4%	66,439	12.0%
Education	39,604	7.3%	99,713	18.0%
Art	11,934	2.2%	16,384	3.0%
Sales	86,650	16.0%	81,817	14.7%
Primary	8,239	1.5%	1,366	0.2%
Manufacturing	43,217	8.0%	13,335	2.4%
Industry				
Financial	78,660	14.5%	97,392	17.5%
Construction	196,515	36.2%	66,882	12.0%
Trade	82,930	15.3%	75,629	13.6%
Government	63,939	11.8%	64,764	11.7%
Education/Health	63,490	11.7%	191,406	34.5%
Accommodation	56,982	10.5%	59,060	10.6%

Source: 2011 National Household Survey and author's calculations

The descriptive statistics for men and women in Canada excluding Quebec shown below in Table 5 are relatively similar to those from the Quebec model with the exception of the language variables. Bilingualism is much less common outside Quebec, with only 7.3 percent of men and 9.2 percent of women in Canada excluding Quebec belonging to one of the four bilingual categories.

Table 5- Selected Descriptive Statistics for Men and Women in Canada excluding Quebec

	Men		Women	
	Weighted N	**Percentage**	**Weighted N**	**Percentage**
Total	**1,734,218**	**100%**	**1,638,562**	**100%**
Region				
Ontario	834,097	48.1%	791,001	48.3%
Atlantic	180,064	10.4%	189,598	11.6%
Prairie	164,893	9.5%	159,693	9.7%
West	555,164	32.0%	498,270	30.4%
Marital Status				
Single	400,261	23.1%	355,615	21.7%
Common-Law	213,657	12.3%	219,296	13.4%
Married	1,001,016	57.7%	852,562	52.0%
Divorced/Separated /Widowed	119,284	6.9%	211,090	12.9%
Schooling				
High School	534,670	30.8%	452,635	27.6%
Trade/College	730,513	42.1%	669,598	40.9%
Undergraduate	361,629	20.9%	417,414	25.5%
Graduate	107,406	6.2%	98,916	6.0%
Language				
UnilENGLISH	1,607,485	92.7%	1,488,497	90.8%
BilMFNO	486	0.0%	1,415	0.1%
BilMFFE	1,805	0.1%	6,365	0.4%
BilMENO	95,571	5.5%	105,379	6.4%
BilMEFF	28,871	1.7%	36,907	2.3%
Occupation				
Trades	352,878	20.3%	19,801	1.2%
Management	301,965	17.4%	200,380	12.2%
Business	214,459	12.4%	550,925	33.6%
Sciences	233,044	13.4%	64,073	3.9%
Health	34,567	2.0%	192,202	11.7%
Education	125,814	7.3%	275,831	16.8%
Art	36,563	2.1%	40,808	2.5%
Sales	295,413	17.0%	261,560	16.0%
Primary	34,088	2.0%	7,145	0.4%
Manufacturing	105,427	6.1%	25,838	1.6%
Industry				
Financial	277,721	16.0%	305,877	18.7%
Construction	571,249	32.9%	188,724	11.5%
Trade	304,552	17.6%	222,849	13.6%
Government	210,673	12.1%	183,592	11.2%
Education/Health	171,538	9.9%	537,998	32.8%
Accommodation	198,485	11.4%	199,523	12.2%

Source: 2011 National Household Survey and author's calculations

Finally, the weighted average annual wages for men and women in each language group in both Quebec and Canada excluding Quebec are shown below in Table 6. In Quebec, all bilingual categories show higher average wages than the unilingual French category, suggesting there may be significant rewards to bilingualism. This is not the case outside Quebec, however, as bilingual men who only use French at work or mostly use French at work have lower average earnings than unilingual English men, and bilingual women who only use French at work have lower average earnings than unilingual English women. For each language group in Quebec men always have higher earnings than women, while in Canada excluding Quebec women have the higher average earnings in the only-French and mainly-French categories.

Table 6- Weighted Average Annual Wages for Men and Women, Quebec and Canada excluding Quebec, by Language Group

	Weighted Average Annual Wages			
	Quebec		**Canada excluding Quebec**	
	Men	**Women**	**Men**	**Women**
Total	**60,358**	**46,007**	**75,908**	**54,259**
Language Group				
Unilingual French	51,738	41,639	-	-
Unilingual English	-	-	75,274	53,439
Bilingual, only using French at work	59,336	48,630	46,000	50,162
Bilingual, mostly using French at work, occasionally using English	70,005	51,229	58,810	61,325
Bilingual, only using English at work	70,880	52,682	84,824	62,042
Bilingual, mostly using English at work, occasionally using French	88,829	59,801	83,236	64,026

Source: 2011 National Household Survey and author's calculations

4.2 Regression Results for Canada excluding Quebec

Beginning with equation 1, which is the basic estimated log earnings equation for men outside Quebec without variables for occupation and industry, all control variables have statistically significant estimated coefficients of the expected signs. On average and holding all else constant, earnings appear to be the lowest in Atlantic Canada and the highest in the west, while currently-married men receive a fairly large wage premium over single men, and those who were previously married or currently living common law receive a smaller wage premium. Earnings increase with each additional year of work experience and finally, as expected, earnings appear to increase along with the level of schooling, with men holding graduate degrees experiencing the highest wage premium when compared to men with only a high school education. The estimated language coefficients in equation 1 provide statistically significant evidence that both language knowledge and language use can have an effect on the earnings of men outside of Quebec. When compared with men that are only fluent in English, the earnings of bilingual men that only use English in the workplace are 3.1 percent higher on average, holding all else constant. Furthermore, the wage premium increases for bilingual men who frequently use French in the workplace, with this group earning a 6.7 percent wage premium over unilingual men. Next, despite the language group's small sample size, there is evidence that bilingual men who only speak French at work actually experience 25.4 percent lower earnings than unilingual English men. While the estimated coefficient for the variable representing bilingual men who mostly use French and frequently use English is negative as well, it is not statistically significant.

In equation 2, the estimated log earnings equation for men outside of Quebec, which includes variables for occupation and industry, the control variables for region, marital status, experience and schooling all once again have statistically significant estimated coefficients of the expected signs, and are similar in magnitude to those from equation 1. The highest wage premiums are found in management, health, and science occupations, and government as well as primary and secondary industries. Finally, the addition of variables for occupation and industry in equation 2 removes all of the statistical significance previously associated with the estimated coefficients for the language variables.

For women, beginning with equation 3, their basic estimated log earnings equation without variables for occupation and industry, the control variables for region, marital status, experience and schooling once again all have statistically significant estimated coefficients of the expected signs. Additionally, these estimated coefficients are relatively close in magnitude to those from equations 1 and 2 for men in Canada excluding Quebec, with the exception of those associated with marital status. While all else held constant, the men from equation 1 see a 30.0 percent wage premium for being married and roughly half that amount for living common law or being divorced, separated or widowed, in equation 3 married women only receive a 6.7 percent wage premium, and those who are common-law or divorced, separated or widowed receive a 3.9 to 4.9 percent premium. While certainly an interesting finding in itself, the phenomenon of men receiving a greater 'marriage premium' is not an uncommon one in economics. Moving on to the language variables for equation 3, there is statistically significant evidence that both language knowledge and language use can have an effect on the earnings of women

in Canada outside Quebec. All else held constant, a bilingual woman who uses only English at work is predicted to have a 3.6 percent wage premium over a unilingual English woman, while a woman who frequently uses French at work is predicted to see an 11.3 percent wage premium. Although there is no evidence that bilingual women who only speak French at work experience a wage premium, there is a statistically significant 12.6 percent wage premium estimated for bilingual women who primarily speak French at work but frequently use English.

The addition of control variables for occupation and industry to the estimated log earnings equation for women in Canada excluding Quebec in equation 4 reduces the statistical significance of the estimated coefficients for marital status, but in general has little overall effect on the control variables. As is the case with equation 2 for men in Canada excluding Quebec, the highest wage premiums are found in management, health, and science occupations, and government as well as primary and secondary industries. Contrary to the findings for men, however, even with the addition of occupation and industry variables, bilingual women in Canada excluding Quebec still see a statistically significant 6.2 percent wage premium over unilingual English women if they use mainly English at work and frequently French, and a 13.4 percent wage premium if they mainly use French at work and frequently use English. There is no evidence of a wage premium for bilingual women who do not actively use both languages at work.

Full regression results for Canada excluding Quebec are presented below in Table 7:

Table 7- Ln Earnings Regression Results for Men and Women in Canada excluding Quebec (|t|-statistics)

	Men		Women	
	1	**2**	**3**	**4**
Constant	9.954 (700.00)	10.045	9.803 (706.15)	9.971 (319.03)
Region (Ontario)				
Atlantic	-0.173 (15.46)	-0.166 (15.64)	-0.179 (18.96)	-0.170 (19.08)
Prairie	-0.044 (4.31)	-0.035 (3.55)	-0.047 (4.28)	-0.050 (4.77)
West	0.111 (14.77)	0.106 (14.79)	0.047 (6.20)	0.041 (5.83)
Marital Status (Single)				
Common-Law	0.169 (14.73)	0.147 (13.33)	0.049 (4.50)	0.031 (2.98)
Married	0.300 (33.33)	0.257 (29.66)	0.067 (8.50)	0.040 (4.84)
Divorced/Separated/Widowed	0.155 (10.79)	0.140 (10.16)	0.039 (3.17)	0.019 (1.68)
Experience	0.053 (40.64)	0.048 (37.92)	0.050 (42.93)	0.044 (39.70)
Experience Squared	-0.001 (32.22)	-0.001 (30.35)	-0.001 (31.12)	-0.001 (28.81)
Schooling (High School)				
Trade College	0.202 (26.31)	0.173 (22.70)	0.209 (25.22)	0.135 (16.27)
Undergraduate	0.488 (51.31)	0.413 (40.21)	0.598 (64.76)	0.467 (46.06)
Graduate	0.666 (44.39)	0.598 (37.67)	0.793 (55.97)	0.637 (42.51)
Language (UnilENGLISH)				
BilMENO	0.031 (2.27)	0.018 (1.32)	0.036 (2.98)	0.020 (1.73)
BilMEFF	0.067 (2.96)	0.023 (1.08)	0.113 (6.29)	0.062 (3.65)
BilMFNO	-0.254 (2.37)	-0.155 (1.36)	0.001 (0.01)	0.038 (0.67)
BilMFFE	-0.088 (1.58)	-0.032 (0.61)	0.126 (5.53)	0.134 (5.64)
Occupation (Trades)				
Management	-	0.335 (30.79)	-	0.284 (9.75)
Business	-	0.005 (0.47)	-	0.006 (0.21)
Sciences	-	0.148 (14.32)	-	0.194 (6.32)
Health	-	0.201 (7.65)	-	0.202 (6.72)
Education	-	0.070 (4.17)	-	0.090 (3.04)
Art	-	-0.032 (1.36)	-	0.029 (0.86)
Sales	-	-0.042 (3.77)	-	-0.205 (6.93)
Primary	-	-0.114 (3.65)	-	-0.481 (6.66)
Manufacturing	-	-0.082 (5.44)	-	-0.151 (4.12)
Industry (Financial)				
Construction	-	0.050 (4.65)	-	0.089 (7.48)
Trade	-	-0.167 (13.89)	-	-0.150 (12.52)
Government	-	0.065 (5.68)	-	0.116 (10.82)
Education/Health	-	-0.198 (14.12)	-	-0.085 (8.40)
Accommodation	-	-0.223 (16.92)	-	-0.193 (15.38)
Adjusted R Squared	0.259	0.316	0.236	0.310
# of sample observations	46,402		43,852	
Weighted N	1,734,218		1,638,562	

Source: 2011 National Household Survey and author's calculations

4.3 Regression Results for Quebec

Beginning with equation 1, the basic estimated log earnings equation for men in Quebec without variables for occupation and industry, all control variables have statistically significant estimated coefficients of the expected signs, and are similar in magnitude to those seen in the Canada excluding Quebec equations. Additionally, all language variables have statistically significant and positive estimated coefficients. First, when compared to unilingual French individuals, bilingual men who use only French at work are predicted to receive a 6.8 percent wage premium, while those who also frequently use English receive a 19.2 percent wage premium, all else held constant. The returns are even higher for bilingual men who mainly speak English in the workplace, with those who do not additionally use French earning a 15.4 percent wage premium and those who do earning a 33.4 percent wage premium.

In equation 2, the addition of occupation and industry variables appears to have little effect on the estimated coefficients of the original control variables. All remain statistically significant, though they are slightly smaller in magnitude than the coefficients from equation 1. Furthermore, as is the case in Canada excluding Quebec, the highest earnings in Quebec are also associated with occupations in management, health, and sciences, and government and primary and secondary industries. Contrary to what is seen outside Quebec, however, even with the addition of occupation and industry variables there is evidence that bilingualism is rewarded for men in Quebec. When compared to their unilingual French counterparts, bilingual men who only use French at work are expected to receive a 5.3 percent wage premium, while those who mainly use French but frequently use English receive a 15.4 percent wage premium. Bilingualism

has an even stronger impact on wages for men in Quebec who mostly use English at work, with those who do not also use French earning a 12.4 percent wage premium and those who do earning a 27.5 percent premium.

Equation 3, the first of two equations showing the expected earnings of women in Quebec, is the first to show non-statistically significant estimated coefficients for marital status control variables. All other control variables, however, have estimated coefficients with values similar to those from the other equations being considered. The language variables in equation 3 all have statistically significant estimated coefficients slightly smaller in magnitude to those in equation 1 for men. When compared to unilingual French women in Quebec, those who are bilingual but only use French at work receive a 5.7 percent wage premium, while those who mainly use French but frequently use English receive a 17.9 percent wage premium. The returns are once again even better for those who mainly speak English in the workplace, with women who do not additionally use French earning a 15.3 percent wage premium and those who do earning a 29.3 percent wage premium.

Finally, in equation 4, the addition of occupation and industry control variables has little effect on the estimated coefficients for experience and education, while the conclusions from the estimated coefficients for occupation and industry are the same as those already seen with the other equations. All estimated coefficients for language variables remain statistically significant, and are only slightly smaller in magnitude in equation 4 than they were previously in equation 3 before the addition of variables. Bilingual women in Quebec who only use French at work can expect a 4.4 percent wage premium over their unilingual French counterparts, while those who primarily use French

and frequently English are predicted to earn a 16.1 percent wage premium. Bilingual women who only use English in the workplace experience a 12.4 percent wage premium, while those who mainly use English but frequently use French experience a 26.1 percent wage premium.

Full regression results for Quebec are presented below in Table 8:

Table 8- Ln Earnings Regression Results for Men and Women in Quebec (|t|-statistics)

	Men		Women	
	1	**2**	**3**	**4**
Constant	9.827 (469.21)	9.932 (381.33)	9.666 (482.85)	9.810 (196.68)
Marital Status (Single)				
Common-Law	0.213 (16.58)	0.187 (15.03)	0.021 (1.52)	-0.004 (0.31)
Married	0.273(18.77)	0.236 (16.93)	0.030 (1.99)	0.001 (0.08)
Divorced/Separated/Widowed	0.129 (5.65)	0.115 (5.35)	0.028 (1.59)	0.010 (0.61)
Experience	0.050 (25.81)	0.045 (24.21)	0.045 (26.22)	0.041 (24.53)
Experience Squared	-0.001 (20.08)	-0.001 (18.97)	-0.001 (18.81)	-0.001 (17.63)
Schooling (High School)				
Trade/College	0.142 (11.16)	0.106 (8.61)	0.187 (14.23)	0.123 (9.75)
Undergraduate	0.466 (28.11)	0.375 (20.45)	0.613 (41.72)	0.486 (31.54)
Graduate	0.622 (27.06)	0.528 (21.99)	0.785 (33.36)	0.618 (26.36)
Language (UnilFRENCH)				
BilMFNO	0.068 (5.57)	0.053 (4.58)	0.057 (4.68)	0.044 (3.69)
BilMFFE	0.192 (15.55)	0.154 (12.87)	0.179 (15.36)	0.161 (13.52)
BilMENO	0.154 (3.14)	0.124 (2.54)	0.153 (2.59)	0.124 (2.26)
BilMEFF	0.334 (13.67)	0.275 (11.60)	0.293 (11.50)	0.261 (11.03)
Occupation (Trades)				
Management	-	0.293 (16.30)	-	0.282 (6.19)
Business	-	-0.008 (0.51)	-	0.016 (0.36)
Sciences	-	0.120 (7.73)	-	0.121 (2.23)
Health	-	0.087 (2.36)	-	0.145 (3.15)
Education	-	0.035 (1.50)	-	0.071 (1.57)
Art	-	0.010 (0.31)	-	0.033 (0.66)
Sales	-	-0.082 (4.55)	-	-0.164 (3.62)
Primary	-	-0.368 (5.57)	-	-0.431 (5.23)
Manufacturing	-	-0.048 (2.62)	-	-0.179 (3.43)
Industry (Financial)				
Construction	-	0.069 (4.33)	-	0.056 (2.98)
Trade	-	-0.150 (7.91)	-	-0.189 (9.88)
Government	-	0.128 (7.24)	-	0.123 (7.26)
Education/Health	-	-0.104 (5.02)	-	-0.046 (2.86)
Accommodation	-	-0.162 (8.25)	-	-0.164 (7.81)
Adjusted R Squared	0.266	0.325	0.254	0.318
# of sample observations	15,148		15,361	
Weighted N	542,516		555,132	

Source: 2011 National Household Survey and author's calculations

5. DISCUSSION

5.1 Discussion of Results

From the results, it appears that outside of Quebec, the returns to bilingualism are limited to women only once occupation and industry have both been controlled for, and that the returns are associated with actual language *use* in the workplace and not simply language *knowledge*. Additionally, the wage premium appears to be larger for women who primarily use French in the workplace and frequently use English, than for women who primarily use English in the workplace and frequently use French. For men, just as Christofides and Swidinsky (2010) find, controlling for occupation and industry eliminates all statistical significance previously associated with the estimated coefficients for the language variables. A potential conclusion from this finding is that for men in Canada excluding Quebec, language may have a greater effect on the choice of occupation and industry than on the actual wages received within any given occupation or industry. Although at first it seems unusual that men outside of Quebec do not appear to receive a wage premium for actively using both languages in the workplace, this is in fact consistent with the findings by Henley and Jones (2005) and Williams (2011). While both of these previous studies suggest that occupational differences may be behind the difference in the rewards to bilingualism for men and women, this study may provide evidence that this is not the case given that both occupation and industry are controlled for in the models. The fact that bilingualism is most highly rewarded for women in Canada excluding Quebec who mainly speak French at work and frequently English is also of significant interest, and could potentially be explained by several factors. Given

that English is the only official language in every province except Quebec and New Brunswick, it could be that individuals who mainly speak French at work have greater language proficiency levels than someone who only occasionally uses their French second language skills at work, thus tying the wage premium for bilingualism to one's fluency in their second language. Alternatively, if it is assumed that all individuals who use both languages at work have equal language ability regardless of which language they use most often, then the higher wage premium associated with those who mainly speak French at work could potentially be attributed to the fact that fewer people with English as their mother tongue wish to work in a position where they must primarily speak French. If this is the case, it could lead employers to offer wage incentives in order to attract qualified employees.

Contrary to what is found elsewhere, in Quebec both language knowledge and language use appear to be significantly valued in both men and women. This is likely explained by Quebec's status as a French province in a country with primarily English provinces, and the simple fact that English continues to be the language of international business. The ability to speak English in the workplace could be considered a very useful asset in many circumstances, making it clear why a wage premium is found for employees using their second language at work. It is less clear, however, why language *knowledge* appears to be valued by employers in Quebec much more than in Canada excluding Quebec. This finding may suggest that bilingualism acts as a stronger signal for ability in Quebec than in Canada excluding Quebec, despite the fact that bilingualism is significantly more common within the province.

5.2 Limitations

There are three key limitations to this study, with the first being the lack of an available indicator for any given individual's language proficiency. Given that the 2011 NHS data only includes a variable for self-reported language knowledge with no detailed information on fluency, it is not possible to determine the level of language proficiency an individual must attain in order to potentially experience a wage premium. Furthermore, the difference in wage premiums received by individuals at two different levels of second language proficiency cannot be obtained. The second limitation involves the very nature of the 2011 NHS itself. Given that it was a voluntary survey, it is possible that the resulting data suffers from non-response bias. It could be, for example, that Canadians with either low or exceptionally high incomes do not wish to report their earnings, and so these individuals would not have filled out and returned the 2011 NHS. This phenomenon would then result in the data not being a representative sample of the Canadian population. The final limitation to this study is the small sample size associated with some of the language variables, as this reduces the likelihood of finding reliable and statistically significant estimated coefficients. More specifically, although the weighted sample sizes appear satisfactory, the original sample itself only contains data on 55 individuals in Canada excluding Quebec that are bilingual but only speak French at work, and 228 individuals that are bilingual but mostly use French at work.

5.3 Recommendations for Further Research

Several opportunities remain for further research on the topic of labour market returns to bilingualism, though the primary challenge is in obtaining the data necessary

for this analysis. In Canada, it could be useful to investigate how the various language proficiency levels impact earnings, if at all. Furthermore, research on the case of individuals in Canada excluding Quebec with French as their mother tongue and individuals in Quebec with English as their mother tongue could potentially be of value, as these categories are omitted from this study. It may also be interesting to focus on and compare individual cities or regions to see how factors such as tourism or the local bilingualism rate may affect bilingualism's impact on earnings. Finally, as language diversity in Canada continues to increase, there is likely to be a growing demand for research concerning earnings and bilingualism involving languages other than English and French.

5.4 Implications

The findings from this study suggesting that bilingualism may, in some circumstances, be associated with higher earnings could have several implications for Canadians and bilingual policy. Outside of Quebec given that there is no evidence that second language use impacts the earnings of men when occupation and industry are controlled for, the trend to promote French as a second language for primarily social or cultural reasons is likely to continue. It is still important to consider, however, that even if a bilingual man is not being paid more than his unilingual peer, the fact that he is bilingual may very well have contributed to his ability to secure that particular role. It is much more straightforward for women in Canada excluding Quebec, as the wage premium remains even when occupation and industry are held constant. The evidence that bilingual women who actually use both languages in the workplace may receive a

wage premium could provide an extra incentive for them to seek out bilingual roles in the future. In Quebec, where there is strong evidence suggesting that both language knowledge and language use impact earnings for both men and women, there may eventually be a push towards bilingualism for economic reasons and not simply cultural or social reasons. As an example, parents may choose to enroll their children in second language classes, hoping to increase the child's job opportunities and earning potential later on in life.

6. CONCLUSION

While English-French bilingualism is often associated with a variety of social and cultural benefits, there is growing evidence that it may directly contribute to higher earnings as well. This study serves as an update on the overall impact of bilingualism on wages in Canada, and builds on the work started by Christofides and Swidinsky (2010) on distinguishing between the impacts of language *knowledge* and language *use*. This distinction is particularly important as it determines whether bilingualism is being valued for its actual use in the workplace, or simply because it signals unobservable but desirable traits to employers.

In Canada excluding Quebec, this study finds no evidence of a wage premium existing for bilingual men once occupation and industry are controlled for. Bilingual women, however, are found to receive a statistically significant 6.2 percent wage premium over unilingual English women if they use mainly English at work and frequently French, and an even higher 13.4 percent wage premium if they mainly use French at work and frequently use English. There is no evidence to suggest that bilingualism serves as a signal for ability outside of Quebec, as language skills are only valued by employers if both languages are actually used in the workplace.

In Quebec, there is evidence that bilingualism is rewarded regardless of whether it is used in the workplace, though the wage premium is substantially higher for individuals actively using both languages. Bilingual men who only use French at work are expected to receive a 5.3 percent wage premium, while those who mainly use French but frequently use English receive a 19.2 percent wage premium. The figures are even higher for men who only use English at work and those who mainly use English but frequently

use French, with these groups earning a 15.4 and 33.4 percent wage premium respectively. A similar pattern emerges for bilingual women in Quebec, with those who only use French at work earning a 4.4 percent wage premium and those who mainly use French but frequently use English earning a 16.1 percent wage premium. Women in Quebec who only use English in the workplace experience a 12.4 percent wage premium, while those who mainly use English but frequently use French experience a 26.1 percent wage premium.

It is important to understand the returns to bilingualism in Canada given the significant opportunity costs associated with it. Learning a second language takes years of practice, and classes can be costly not only for those who choose to enroll in private training, but for the government which provides such classes at many public schools across the country. In Quebec, there is no question that learning a second language is worth it - there are too many personal, cultural, societal, and economic benefits associated with bilingualism within the province to list. Outside of Quebec, however, the mixed evidence for the existence of a wage premium for bilinguals may offer some insight into why there is sometimes uncertainty surrounding both bilingual policy and Canadians' decisions to learn a second official language. While this study suggests that some bilinguals outside Quebec may experience a greater return on their investment in second language training than others, this is certainly not to say that only those individuals should invest in bilingualism, or that overall efforts to promote bilingualism should be questioned. Rather, in Canada excluding Quebec, efforts to promote English-French bilingualism should focus on how it can strengthen the fabric of Canadian society,

and provide a wide range of non-monetary benefits to individuals willing to learn both languages.

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