Returns to education for French and English speakers in Canada

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Introduction:

Canada is a country located in North America. It is the second largest country of the world with a total surface area of 9,984,670 km2. The land occupied by Canada was originally occupied for thousands of years by several groups of aboriginal people (referred in Canada as "first nations"). Starting in the late 15th century, the French and the British colonizers explored and later settled in the Atlantic coast. In 1793, as a result of the Seven Years' War France had to give up its colonies in North America. 1867, with the unification of three British North American colonies through Confederation, Canada was created as a federal dominion of four provinces.

These historical events explain the origins of a bilingual Canada. English Canada is represented by the following provinces: Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island and Saskatchewan French Canada is only represented by the province of Quebec. 90.92% of French speaking Canadians live in Quebec. In total, French speaking Canadians represent 21.4% of the Canadian population, making them a minority within the country.

The following table shows how Quebec is the only province where French is the most spoken language. It is worth noting that besides Quebec, New Brunswick is the only province with a sizeable French speaking population (almost 30%), however, New Brunswick's population does not even reach a million people. For the other provinces French speakers do not represent more than 3% of the province's population

Province/Territory	Total population	English	%	French	%	Other languages	%	Official Language(s)
Ontario	12,028,895	9,789,937	81.4%	304,727	2.5%	1,934,235	16.1%	English (de facto), French (de jure)
Quebec	7,435,905	787,885	10.6%	6,085,152	81.8%	562,860	7.6%	French
British Columbia	4,074,800	3,380,253	83.0%	19,361	0.5%	676,911	16.6%	English (de facto)
Alberta	3,256,356	2,915,867	89.5%	21,347	0.7%	319,142	9.8%	English (de facto)
Manitoba	1,133,515	997,598	88.0%	20,515	1.8%	115,398	10.1%	English (de facto), French (de jure)
Saskatchewan	953,850	900,231	94.4%	4,318	0.5%	49,301	5.2%	English (de facto)
Nova Scotia	903,090	868,408	96.2%	17,871	1.9%	16,811	1.9%	English (de facto)
New Brunswick	719,650	496,850	69.0%	213,878	29.7%	8,913	1.2%	English, French
Newfoundland and Labrador	500,605	494,695	98.9%	740	0.1%	5,170	1.0%	English (de facto)
Prince Edward Island	134,205	130,270	97.1%	2,755	2.1%	1,175	0.9%	English (de facto)
Northwest Territories	41,055	36,918	89.9%	458	1.1%	3,678	9.0%	English, French, Other aboriginal languages
Yukon	30,195	28,711	94.8%	578	1.9%	985	3.3%	English, French
Nunavut	29,325	13,120	44.7%	228	0.8%	15,950	54.5%	Inuktituk, English, French, Inuinnaqtun
Canada	31,241,446	20,840,743	66.7%	6,691,928	21.4%	3,710,529	11.9%	English, French

Source: Statistics Canada, 2006 Census Profile of Federal Electoral Districts (2003 Representation Order): Language, Mobility and Migration and Immigration and Citizenship. (Figures combine single and multiple responses. Multiple responses for "French/English", "French/Other" and "English/Other" were allocated with one-half of all respondents placed in either linguistic category. Multiple responses for English/French/Other" were allocated with one-third of all respondents being placed in each of the three categories.).

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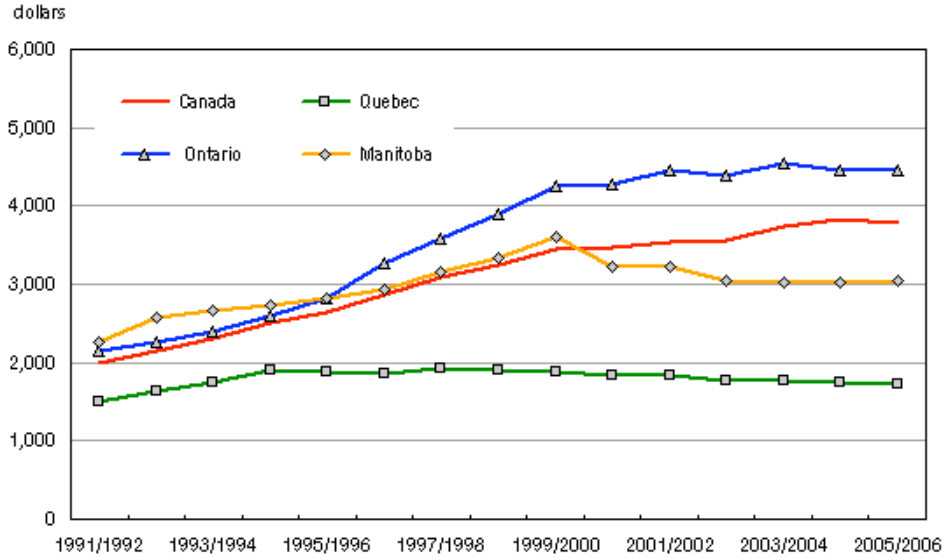
Quebec's education system differs from other provinces, both in terms of structure and in terms of tuition costs.

Education starts at the age of 5 with kindergarten (maternelle) and grades 1-6 as elementary school (école primaire). Secondary School (école secondaire) is five years, from grade 7 to grade 11. High school students who complete grade 11 obtain the governmental Diplôme d'études secondaires (DES). Usually students complete High school at age 17. It should be noted that in the other provinces students are required to do grade 12 in order to graduate from high school. However, provinces other than Quebec do not consider the secondary diploma of Quebec to be sufficient for university admission.

Quebec uses the term "college" for institutions called general and professional education colleges (Collège d' enseignement général et professionel). These institutions overlap the definitions of both secondary and post-secondary education. In Quebec, these institutions are promptly considered post-secondary, but Quebec is the only province that requires 11 years of study in order to obtain the high school diploma. While standard admission to college is based on the secondary school diploma of Quebec (representing completion of grade 11), completion of the two-year college program does not give students the equivalent of a university diploma. Therefore, holders of the two-year college diploma still have to complete a minimum of three years of university education in order to obtain a Bachelor's degree. Consequently, it takes the same amount of years of study (16 years) to get a Bachelor's degree anywhere in Canada. Canadian Law considers Bachelor degrees from government-accredited universities in Canada considered equal, either from Quebec or other provinces.

The main difference between the provinces, with respect to universities, is the quantity of funding they receive. Universities in Quebec receive the most funding and have the lowest tuitions. The following graph is taken from Canada's statistical Agency. It can be seen that the average undergraduate university tuition fees are considerably lower.

Average undergraduate university tuition fees, Canada, Quebec, Ontario and Manitoba, 1991/1992 to 2005/2006 (in 2001 constant dollars)



Objective

Considering the differences stated before between French-Canada and English Canada, we want to test whether these differences affect returns to education. More specifically, we want to examine whether returns to education are different depending on languages in Canada. We will be using the Canadian census of 2001.

Theory

Assessing the impact of determinants on wage is a sketchy process at best. Our ability to measure wages is itself tricky because many workers receive payments in the form of benefits, rather than a wage. People are also likely to forget, when reporting, their actual earnings per week. Additionally, when people are not paid by the hour, it is sometimes difficult to ascertain how many hours such people work, so it becomes complicated to measure their earnings per hour worked. The determinants themselves are not often easily defined, either. It is reasonable to expect that education would have an impact on wages, but how does one quantify an education? Using years of schooling is probably inadequate, first because not all people attain the same level of educational achievement in the same number of years, but also because there is a much greater difference between completing high school and not completing high school than there is between completing eleven years of high school and completing ten. These, and innumerable other problems, plague the econometrician who would try to analyze determinants of wages.

To address some of these issues, we've made some modifications to the form of wage determining equation cited by Berndt as equation 5.1. First, the only independent variables we used which were not dummy variables were weeks worked over the year, hours worked over the year, experience (and experience squared), and education. We could not accurately obtain data on hourly earnings because the weekly data may not have been representative of one's working behavior throughout the year; as a result, we used the natural logs of weeks worked and hours worked to make the scales of the independent variables consistent with that of the dependent variable. To normalize the distribution of income, we went with Berndt's recommendation of using the natural log of income. We used the term for experience squared to account for a negative impact of age on wages after a certain point. The dummy variables for industry account for all the industries listed by the Canadian Census, and we omitted unemployment. Also, to deal with the problem listed above with quantifying education, we first tried using dummy variables for all the possible years of schooling; this was found to be unnecessarily unwieldy. Instead, we ended up using all years of schooling through the end of one's post-secondary education as a discrete variable, but for all education thereafter, each value corresponds to a level of degree achievement. Finally, we chose to examine only Census respondents between the ages of 25 and 60, to avoid unnecessarily large values of unemployment.

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Model:

$LNWAGES= \beta_0 + \beta_1 LNWKSPWKP+\beta_2 LNHRSW0KP+ \beta_3 YOSCHOOLING+ \beta_4 YOSCHOOLING\_ENG+ \beta_5 YOSCHOOLING\_FRE+ \beta_6 YOSCHOOLING\_BOTH +\beta_7 ENGLISH\_ONLY+ \beta_8 FRENCH\_ONLY+ \beta_9 BOTH\_OFFICIAL+ \beta_{10} MALE + \beta_{11} MARRIED\_DUMMY+ \beta_{12} MARRIED\_MAN+ \beta_{13} EXPERIENCE+ \beta_{14} EXPER2+ \beta_{15} OTHERINDS+ \beta_{16} AGRICULTURE+ \beta_{17} MANUFACTURNG+ \beta_{18} CONSTRUT+ \beta_{19} TRANSSTORAGE+ \beta_{20} COMMUTILITES+ \beta_{23} WHOLESALE+ \beta_{24} RETAIL+ \beta_{25} FINACEREALEST+ \beta_{26} BUSINESS+ \beta_{27} GOVFED+ \beta_{28} GOVOTHER+ \beta_{29} EDUCATION+ \beta_{30} HEALTH+ \beta_{31} ACCOFOOD+ \mu_0$

LNWAGES = Natural logarithm of annual income from wages
LNWKSPWKP = Natural logarithm of weeks worked for pay or in self-employment
LNHRSW0KP = Natural logarithm of hours worked for pay or in self-employment for the week prior to census day.
YOSCHOOLING = Total years of schooling which are controlled for the highest degree earned additional years added for post-graduate level
YOSCHOOLING_ENG = Total years of schooling × Speaks only English
YOSCHOOLING_FRE = Total years of schooling × Speaks only French
YOSCHOOLING_BOTH = Total years of schooling × Speaks both official languages
ONLP= Categorial variable for the knolege or profici in the offical languages
ENGLISH_ONLY = 1 if individual Speaks only English, otherwise is 0
FRENCH_ONLY = 1 if individual Speaks only French, otherwise is 0
BOTH_OFFICIAL = 1 if individual Speaks both official languages, otherwise is 0
NEITHER_OFFICIAL =1 if individual Speaks neither official languages, otherwise is 0, Omitted as control for languages
MALE = 1 if gender is male, otherwise is 0
MARRIED_DUMMY = 1 if individual is married, otherwise is 0
MARRIED_MAN = gender × marriage
EXPERIENCE= Potential on-the-job years of training determined by "Age - Total years of schooling- 5"
EXPER2 = Potential on-the-job years of training ^ 2
OTHERINDS =1 if individual is employed in other uncategorized industrial labor, otherwise is 0
AGRICULTURE =1 if individual is employed in agricultural labor, otherwise is 0
MANUFACTURNG =1 if individual is employed in manufacturing labor, otherwise is 0
CONSTRUT =1 if individual is employed in construction labor, otherwise is 0
TRANSSTORAGE =1 if individual is employed in transportation or storage industries, otherwise is 0
COMMUTILITES =1 if individual is employed in communication or utilities industries, otherwise is 0
WHOLESALE =1 if individual is employed in wholesale businesses, otherwise is 0
RETAIL =1 if individual is employed in retail businesses, otherwise is 0
FINACEREALEST= 1 if individual is employed in financial or real estate services, otherwise is 0
BUSINESS = 1 if individual is employed in business services, otherwise is 0
GOVFED = 1 if individual is employed in a federal government position, otherwise is 0

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GOVOTHER =1 if individual is employed in a provincial or local government position, otherwise is 0
EDUCATION =1 if individual is employed in educational services, otherwise is 0
HEALTH =1 if individual is employed in healthcare services, otherwise is 0
ACCOFOOD = 1 if individual is employed in accommodation or food services, otherwise is 0
OTHER =1 if individual is employed in some other occupation food services, otherwise is 0, Omitted as control for Industry.
PROVP_QUEBEC = 1 if individual is a resident in the province of Quebec, otherwise is 0

Data & Methods

Our data comes from the *2001 Census Public Use Microdata File*. There are a few things worth noting about our data: some of the small territories and provinces were not include in the census, some of the variables were recorded as "Not Available," the data on income is censored – namely it has lower and upper limits. We dealt with these problems by making some adjustments. For instance we changed all of the "Not Available" responses to mere missing data points. Although the income was censored we didn't feel that running a censored regression was necessary since our results make sense and the people with salaries outside of the limits can be viewed simply as statistical outliers.

We used STATA 11 to perform all of the computation for this project. Each of our regressions uses an ordinary least squares regression. This makes a host of assumptions, which are familiar to most econometrics students. We used a number of statistical techniques acquired throughout the semester including dummy variables, interaction terms and nonlinear parameters.

In order to assist in generating the interaction terms we used STATA's "xi reg" command, which performs an interaction expansion, and runs the desired regression with the interaction terms.

Results

The results of our first regression (1), shows the omission of language interaction terms do not result in substantial omitted variable bias. Even though language interactions enter in the second regression and they significant and with reasonably large coefficients, it does not appear to have a significant impact in our $R^{2.}$

For out first regressions (1) we included the following variables: LNWKSPWKP (log of weeks worked), LNHRSW0KP (log of hours worked) and YOSCHOOLING (total years of schooling). The regression has a $R^{2.}$ of 0.36 and he 4 variables are significant at a 1% level. In our second regression (2), we included dummy variable for languages, these were ENGLISH_ONLY, FRENCH_ONLY and BOTH_OFFICIAL and are significant at the 1% level. For our third regression (3) we included the variables YOSCHOOLING_ENG, YOSCHOOLING_FRE and YOSCHOOLING_BOTH, these are interaction terms for total years of schooling and languages. When comparing the second and third regression to the first one, it can be seen that the omission of language

dummy variables and interaction terms do not result in substantial omitted variable bias. Even though all of these new included variables are significant and have reasonably large coefficients, it does not appear to have a significant impact in our $R^{2.}$. The $R^{2.}$ is 0.360 for the three regressions, which means that 36% of the variation in the data is explained through this regression.

It is worth noting the coefficient change of the ENGLISH_ONLY variable from the second regression to the third regression. In the second regression the ENGLISH_ONLY variable has a coefficient of 0.198, which is larger than the coefficient for FRENCH_ONLY (0.127), however, in the third regression the coefficient for ENGLISH_ONLY is much smaller (0.0625). We suspect that the reason for this is the addition of the interaction terms, which probably capture part of this effect. It can be seen that the YOSCHOOLING_ENG variable coefficient in the third regression is larger (less negative) than the YOSCHOOLING_FRE variable coefficient. Which goes along with out intuition of English speakers having a higher return to education.

To address other potential omitted variables bias, we included other variables besides the ones for education and languages. We included variables that we thought to be relevant in an individual's potential wage such as gender, marital status and experience (both linear and quadratic form). The results from this fourth regression (4) show that all of the new included variables are significant at a 1% level. The R^2 for this regression is 0.435. This is a considerable increase from our past regressions. This shows the importance of including these variable when determining wage. The positive coefficients for MALE, MARRIED_DUMMY, MARRIED_MAN and EXPERIENCE have positive coefficients. These results follow our intuition. Men tend to have higher wages whether because of potential discrimination against women or perhaps as noted by Berndt; women take more time off their career due to maternity leave. Also, it is very reasonable to expect married people (specially men) to have higher wages. The costs of having a "family" motivate individuals to work harder.

We ran a fifth (5) and a sixth (6) regression where we included dummy variables for different kinds of industries. We included these variables because we thought that they were relevant to explain wages. The difference between the 2 regressions is our control variable. For the fifth regression we controlled for OTHERINDS and for the sixth regression we controlled for OTHER. However, the meaning of the results was not very different. For example, it can be seen in both that being in the business sector (coefficients of -0.236 and 0.366) is more profitable than being in the agricultural sector (coefficients of -0.827 and -0.255). We tested for the joint significance of the industry variables and they proved to be significant. The R^2 for the two regressions was 0.459. Which is an improvement from the fourth regression (0.435).

For our final regression (7), we included the PROVP_QUEBEC dummy variable, to determine the effects of living in Quebec. We previously used the STATA xi command to create interaction terms of PROVP_QUEBEC with all the other variables and ran an F-test. The results of this test lead us to include the PROVP_QUEBEC variable. The coefficient for this variable is -0.0327 and it is significant at a 1% level.

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OLS regression estimates for the % of wages earned in the year 2001

VARIABLES	(1) LNWAGESP	(2) LNWAGESP	(3) LNWAGESP	(6) LNWAGESP
LNWKSPWKP	1.003***	1.003***	1.004***	0.844***
	(0.00366)	(0.00366)	(0.00366)	(0.00354)
LNHRSW0KP	0.713***	0.713***	0.711***	0.521***
	(0.00343)	(0.00343)	(0.00343)	(0.00339)
YOSCHOOLING	0.0583***	0.0572***	0.0620***	0.0214***
	(0.000487)	(0.000497)	(0.00102)	(0.00528)
YOSCHOOLING_ENG			-0.00333***	0.0522***
			(0.00119)	(0.00531)
YOSCHOOLING_FRE			-0.0185***	0.0499***
			(0.00177)	(0.00545)
YOSCHOOLING_BOTH				0.0603***
				(0.00537)
ENGLISH_ONLY		0.198***	0.0625***	-0.250***
		(0.0219)	(0.0181)	(0.0577)
FRENCH_ONLY		0.127***	0.192***	-0.311***
		(0.0223)	(0.0252)	(0.0600)
BOTH_OFFICIAL		0.192***		-0.337***
		(0.0221)		(0.0593)
MALE				0.182***
				(0.00506)
MARRIED_DUMMY				0.0645***
				(0.00478)
MARRIED_MAN				0.157***
				(0.00635)
EXPERIENCE				0.0514***
				(0.000399)
EXPER2				-0.000797***
				(8.57e-06)
NEITHER_OFFICIAL			-0.168	
			(0.142)	
Constant	2.848***	2.866***	3.275***	3.405***
	(0.0165)	(0.0165)	(0.165)	(0.0592)
Observations	337620	337620	337620	337620
R-squared	0.360	0.360	0.360	0.435

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(6) LNWAGESP	(7) LNWAGESP	(8) LNWAGESP

LNWKSPWKP	0.832***	0.832***	0.832***
	(0.00348)	(0.00348)	(0.00348)
LNHRSW0KP	0.486***	0.486***	0.486***
	(0.00335)	(0.00335)	(0.00335)
YOSCHOOLING	0.0215***	0.0215***	0.0214***
	(0.00517)	(0.00517)	(0.00517)
YOSCHOOLING_ENG	0.0427***	0.0427***	0.0428***
	(0.00520)	(0.00520)	(0.00520)
YOSCHOOLING_FRE	0.0416***	0.0417***	0.0419***
	(0.00533)	(0.00533)	(0.00533)
YOSCHOOLING_BOTH	0.0501***	0.0501***	0.0502***
	(0.00526)	(0.00526)	(0.00526)
ENGLISH_ONLY	-0.200***	-0.200***	-0.203***
	(0.0565)	(0.0565)	(0.0565)
FRENCH_ONLY	-0.276***	-0.276***	-0.249***
	(0.0587)	(0.0587)	(0.0590)
BOTH_OFFICIAL	-0.293***	-0.293***	-0.277***
	(0.0580)	(0.0580)	(0.0581)
MALE	0.140***	0.140***	0.141***
	(0.00505)	(0.00505)	(0.00505)
MARRIED_DUMMY	0.0472***	0.0471***	0.0471***
	(0.00469)	(0.00469)	(0.00469)
MARRIED_MAN	0.156***	0.156***	0.156***
	(0.00622)	(0.00622)	(0.00622)
EXPERIENCE	0.0446***	0.0446***	0.0447***
	(0.000396)	(0.000396)	(0.000396)
EXPER2	-0.000686***	-0.000686***	-0.000687***
	(8.45e-06)	(8.45e-06)	(8.45e-06)
AGRICULTURE	-0.827***	-0.225***	-0.225***
	(0.0153)	(0.0122)	(0.0122)
MANUFACTURNG	-0.236***	0.366***	0.367***
	(0.0116)	(0.00708)	(0.00708)
CONSTRUT	-0.280***	0.322***	0.321***
	(0.0127)	(0.00886)	(0.00886)
TRANSSTORAGE	-0.289***	0.313***	0.313***
	(0.0131)	(0.00940)	(0.00940)
COMMUTILITES	-0.131***	0.471***	0.471***
	(0.0138)	(0.0102)	(0.0102)
WHOLESALE	-0.274***	0.328***	0.329***
	(0.0127)	(0.00860)	(0.00861)
RETAIL	-0.585***	0.0164**	0.0164**
	(0.0119)	(0.00723)	(0.00723)
FINACEREALEST	-0.177***	0.425***	0.425***
	(0.0127)	(0.00852)	(0.00852)
BUSINESS	-0.236***	0.366***	0.366***
	(0.0123)	(0.00795)	(0.00795)
GOVFED	-0.0897***	0.512***	0.509***

	(0.0145)	(0.0110)	(0.0110)
GOVOTHER	-0.169***	0.433***	0.433***
	(0.0135)	(0.00972)	(0.00972)
EDUCATION	-0.297***	0.305***	0.304***
	(0.0125)	(0.00807)	(0.00807)
HEALTH	-0.365***	0.237***	0.237***
	(0.0122)	(0.00755)	(0.00755)
ACCOFOOD	-0.728***	-0.126***	-0.126***
	(0.0126)	(0.00826)	(0.00826)
OTHER	-0.602***		
	(0.0125)		
OTHERINDS		0.604***	0.603***
		(0.0126)	(0.0126)
NEITHER_OFFICIAL			
PROVP_QUEBEC			-0.0327***
			(0.00600)
Constant	4.121***	3.519***	3.521***
	(0.0591)	(0.0582)	(0.0582)
Observations	337620	337620	337620
R-squared	0.459	0.459	0.459

When determining the variables to use for our model, we had to look at particular interactions between potentially correlated variables. These interaction terms were studied separately from the models presented above. First, we wanted to determine if our dummy variables for language had any interaction with our YOSCHOOLING variables. Berndt suggested that years of education could be estimated by category since, at least after secondary education, it mostly mattered what kind of degree an individual held rather than total years at school. To test for interaction, we ran a regression using STATA's "xi" command to generate dummy variables for our categories with YOSCHOOLING $*$ OLNP as the interaction term.

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. xi:reg LNWAGES LNWKSPWKP LNHRSW0KP i.YOSCHOOLING*i.OLNP
i.YOSCHOOLING     _IYOSCHOOLI_5-25    (naturally coded; _IYOSCHOOLI_5 omitted)
i.OLNP            _IOLNP_1-4          (naturally coded; _IOLNP_1 omitted)
i.Y~ING*i.OLNP    _IYOSXOLN_#_#       (coded as above)

      Source |       SS       df       MS              Number of obs =  337573
-------------+------------------------------           F( 49,337523) = 3929.75
       Model |  167621.622    49  3420.84942           Prob > F      =  0.0000
    Residual |  293813.89337523  .870500352           R-squared     =  0.3633
-------------+------------------------------           Adj R-squared =  0.3632
       Total |  461435.512337572  1.36692472          Root MSE      =  .93301

------------------------------------------------------------------------------
    LNWAGESP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   LNWKSPWKP |   1.001897   .0036581   273.88   0.000      .994727    1.009067
   LNHRSW0KP |   .7075184   .0034272   206.44   0.000     .7008011    .7142357
_IYOSCHOO~_8 |   .0530824   .0304298     1.74   0.081     -.006559    .1127239
_IYOSCHOO~_9 |   .0021039   .0307435     0.07   0.945    -.0581524    .0623603
_IYOSCHOO~10 |   .0253332   .0288408     0.88   0.380     -.031194    .0818603
_IYOSCHOO~11 |  -.0025274    .028769    -0.09   0.930    -.0589139     .053859
_IYOSCHOO~12 |   .1228868    .027951     4.40   0.000     .0681038    .1776699
_IYOSCHOO~13 |   .1484178   .0282911     5.25   0.000      .092968    .2038677
_IYOSCHOO~17 |   .3985087   .0278753    14.30   0.000     .3438739    .4531435
_IYOSCHOO~18 |   .5344847   .0287989    18.56   0.000     .4780397    .5909297
_IYOSCHOO~19 |   .7275379   .0294801    24.68   0.000     .6697578     .785318
_IYOSCHOO~23 |   .8748836    .037814    23.14   0.000     .8007693    .9489979
_IYOSCHOO~25 |   .7818363   .0422308    18.51   0.000     .6990652    .8646075
    _IOLNP_2 |  -.1250925   .0453863    -2.76   0.006    -.2140482   -.0361367
    _IOLNP_3 |  -.1221149   .0640443    -1.91   0.057    -.2476398      .00341
    _IOLNP_4 |  -.2290758    .05649    -4.06   0.000    -.3397947    -.118357
_IYOSXO~_8_2 |   .0502367   .0502693     1.00   0.318    -.0482897    .1487631
_IYOSXO~_8_3 |   .1125005   .0701837     1.60   0.109    -.0250576    .2500586
_IYOSXO~_8_4 |  -.0578728   .0738136    -0.78   0.433    -.2025454    .0867998
_IYOSXO~_9_2 |   .0841916   .0514954     1.63   0.102    -.0167379    .1851212
_IYOSXO~_9_3 |   .1276005   .0705853     1.81   0.071    -.0107446    .2659456
_IYOSXO~_9_4 |   .1664895   .0959817     1.73   0.083    -.0216318    .3546108
_IYOSXOL~0_2 |   .0632187    .049635     1.27   0.203    -.0340644    .1605018
_IYOSXOL~0_3 |   .1076476   .0672246     1.60   0.109    -.0241107    .2394059
_IYOSXOL~0_4 |   .0405928   .0940041     0.43   0.666    -.1436524     .224838
_IYOSXOL~1_2 |   .1222276   .0486236     2.51   0.012     .0269268    .2175285
_IYOSXOL~1_3 |   .1924774   .0659337     2.92   0.004     .0632493    .3217054
_IYOSXOL~1_4 |   .0539235    .126704     0.43   0.670    -.1944128    .3022597
_IYOSXOL~2_2 |    .075992   .0473278     1.61   0.108    -.0167691     .168753
_IYOSXOL~2_3 |   .1013398   .0648848     1.56   0.118    -.0258326    .2285121
_IYOSXOL~2_4 |  -.0686977   .0789224    -0.87   0.384    -.2233833    .0859879
_IYOSXO~13_2 |   .0452468   .0472916     0.96   0.339    -.0474434     .137937
_IYOSXO~13_3 |   .0969034   .0650521     1.49   0.136    -.0305969    .2244037
_IYOSXO~13_4 |  -.1375115    .094029    -1.46   0.144    -.3218057    .0467827
_IYOSXOL~7_2 |  -.0059574   .0464919    -0.13   0.898    -.0970802    .0851654
_IYOSXOL~7_3 |   .0922086   .0643584     1.43   0.152     -.033932    .2183492
_IYOSXOL~7_4 |  -.2850755   .0878199    -3.25   0.001    -.4571998   -.1129511
_IYOSXO~18_2 |   .0595686   .0507096     1.17   0.240    -.0398207     .158958
_IYOSXO~18_3 |   .1109396   .0653622     1.70   0.090    -.0171684    .2390475
_IYOSXO~18_4 |   -.280688   .2475651    -1.13   0.257    -.7659084    .2045325
_IYOSXO~19_2 |   .0644048   .0629676     1.02   0.306    -.0590099    .1878195
_IYOSXO~19_3 |   .1472208   .0661571     2.23   0.026     .0175548    .2768867
_IYOSXO~19_4 |   -.435669   .3005729    -1.45   0.147    -1.024783    .1534452
_IYOSXO~23_2 |  -.0879798   .1620194    -0.54   0.587    -.4055332    .2295736
_IYOSXO~23_3 |   .1478024   .0757845     1.95   0.051     -.000733    .2963377
_IYOSXO~23_4 |   .3711346   .9350703     0.40   0.691    -1.461576    2.203845
_IYOSXOL~5_2 |   .2571536   .1497389     1.72   0.086    -.0363302    .5506374
_IYOSXOL~5_3 |   .0907348   .0829722     1.09   0.274    -.0718882    .2533579
_IYOSXOL~5_4 |   .8505944   .9352789     0.91   0.363    -.9825251    2.683714
       _cons |   3.453596   .0318012   108.60   0.000     3.391266    3.515925
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```

The joint F-statistic for the joint hypothesis that both the dummy variable for OLNP and the interaction terms are significant is 21456.61, which indicates significance at the 1% level. Most of the YOSCHOOLING dummy variables are significant at the 5% level but the dummies for OLNP and the interaction terms are not significant even at the 10% level. It seems contradictory that the joint F-statistic says the joint hypothesis that the dummies have the same slope and intercept can be rejected but the individual t-statistics

fail to reject it. We can infer that there is a high degree of correlation between the OLNP variable and the interaction terms. Though it is hard to tell which of the coefficients is non-zero, there is strong evidence against the hypothesis that both are zero. Also, the program had dropped YOSCHOOLING terms for 5-7 years of schooling. This is probably due to collinearity among the controlling dummy variables for YOSCHOOLING=5, since there is not much difference for wage for individuals in primary school. This suggests that primary education does not have a significant effect on wages.

Also, we had the same thought with our industry variables. We wanted to determine if the effect of schooling depended on what industry you are employed and how should it be controlled for. We then used an xi regression with YOSCHOOLING*IND80P (list of industry by category) as the interaction term.

The resulting regression has an overall F-statistic that is significant at the 1% level but determining the significance on individual regressions was difficult. The high standard errors in some of the interaction terms, such as COMMUTILI and GOVFED indicate high correlation between YOSCHOOLING and corresponding industry dummy. It would be safe to assume some industry professions require more schooling than others.

```
. xi:reg LNWAGESP LNWKSPWKP LNHRSW0KP i.IND80P*i.YOSCHOOLING
i.IND80P          _IIND80P_1-99       (naturally coded; _IIND80P_1 omitted)
i.YOSCHOOLING     _IYOSCHOOLI_5-25    (naturally coded; _IYOSCHOOLI_5 omitted)
i.I~80P*i.Y~ING   _IINDXYOS_#_#       (coded as above)
note: _IIND80P_99 omitted because of collinearity
note: _IINDXYOS_98_23 omitted because of collinearity
note: _IINDXYOS_98_25 omitted because of collinearity
note: _IINDXYOS_99_8 omitted because of collinearity
note: _IINDXYOS_99_9 omitted because of collinearity
note: _IINDXYOS_99_10 omitted because of collinearity
note: _IINDXYOS_99_11 omitted because of collinearity
note: _IINDXYOS_99_12 omitted because of collinearity
note: _IINDXYOS_99_13 omitted because of collinearity
note: _IINDXYOS_99_17 omitted because of collinearity
note: _IINDXYOS_99_18 omitted because of collinearity
note: _IINDXYOS_99_19 omitted because of collinearity
note: _IINDXYOS_99_23 omitted because of collinearity
note: _IINDXYOS_99_25 omitted because of collinearity
```

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_IYOSCHOO~18	.0052897	.1188885	0.04	0.965	-.2277284	.2383078
_IYOSCHOO~19	.254226	.1427508	1.78	0.075	-.0255614	.5340135
_IYOSCHOO~23	.8193652	.2424734	3.38	0.001	.3441243	1.294606
_IYOSCHOO~25	.7857987	.1287079	6.11	0.000	.5335349	1.038062
_IINDXY~_2_8	.541579	.1711962	3.16	0.002	.2060393	.8771186
_IINDXY~_2_9	.5589824	.1754886	3.19	0.001	.2150298	.902935
_IINDX~_2_10	.559397	.1695956	3.30	0.001	.2269947	.8917994
_IINDX~_2_11	.6183891	.1698703	3.64	0.000	.2854483	.9513299
_IINDX~_2_12	.5164704	.1638912	3.15	0.002	.1952485	.8376924
_IINDX~_2_13	.5351278	.168552	3.17	0.001	.2047707	.8654848
_IINDX~_2_17	.4738949	.1639406	2.89	0.004	.1525761	.7952137
_IINDX~_2_18	.5752751	.1852976	3.10	0.002	.2120973	.938453
_IINDX~_2_19	.5681315	.2121653	2.68	0.007	.1522936	.9839693
_IINDX~_2_23	-.065962	.3416417	-0.19	0.847	-.7355699	.6036459
_IINDX~_2_25	.0974386	.5507033	0.18	0.860	-.9819238	1.176801
_IINDXY~_3_8	.4644372	.1057274	4.39	0.000	.2572146	.6716598
_IINDXY~_3_9	.6147052	.1087967	5.65	0.000	.4014668	.8279436
_IINDX~_3_10	.6434764	.104252	6.17	0.000	.4391455	.8478073
_IINDX~_3_11	.6494898	.1043789	6.22	0.000	.4449101	.8540695
_IINDX~_3_12	.6229281	.0996068	6.25	0.000	.4277016	.8181546
_IINDX~_3_13	.6498864	.1032972	6.29	0.000	.447427	.8523459
_IINDX~_3_17	.6825638	.0998559	6.84	0.000	.4868491	.8782786
_IINDX~_3_18	.7074513	.1244745	5.68	0.000	.4634848	.9514178
_IINDX~_3_19	.6600835	.149033	4.43	0.000	.3679831	.952184
_IINDX~_3_23	.3323628	.2556939	1.30	0.194	-.1687899	.8335155
_IINDX~_3_25	.0276448	.220629	0.13	0.900	-.4047817	.4600714
_IINDXY~_4_8	.2713535	.1180182	2.30	0.021	.0400411	.5026658
_IINDXY~_4_9	.3196034	.1215851	2.63	0.009	.0813001	.5579067
_IINDX~_4_10	.1966073	.1161029	1.69	0.090	-.030951	.4241656
_IINDX~_4_11	.2168837	.1162269	1.87	0.062	-.0109176	.4446851
_IINDX~_4_12	.1083897	.1111211	0.98	0.329	-.1094045	.3261839
_IINDX~_4_13	.1577221	.1149844	1.37	0.170	-.067644	.3830881
_IINDX~_4_17	.1227175	.1112968	1.10	0.270	-.095421	.340856
_IINDX~_4_18	.0762275	.1374691	0.55	0.579	-.1932079	.345663
_IINDX~_4_19	-.0452552	.1752206	-0.26	0.796	-.3886824	.298172
_IINDX~_4_23	-1.196267	.4435522	-2.70	0.007	-2.065617	-.3269175
_IINDX~_4_25	-.8700059	.4709518	-1.85	0.065	-1.793058	.053046
_IINDXY~_5_8	.3920534	.1353533	2.90	0.004	.1267648	.6573419
_IINDXY~_5_9	.5860041	.1384566	4.23	0.000	.3146331	.8573751

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_IINDX~_5_10	.447429	.1329021	3.37	0.001	.1869449	.7079132
_IINDX~_5_11	.4948546	.1331148	3.72	0.000	.2339533	.7557558
_IINDX~_5_12	.417541	.1283835	3.25	0.001	.165913	.669169
_IINDX~_5_13	.4573293	.1319748	3.47	0.001	.1986625	.715996
_IINDX~_5_17	.4205033	.1286995	3.27	0.001	.168256	.6727505
_IINDX~_5_18	.3461317	.1528332	2.26	0.024	.046583	.6456804
_IINDX~_5_19	.3245031	.1839417	1.76	0.078	-.0360173	.6850234
_IINDX~_5_23	-1.083758	.3834289	-2.83	0.005	-1.835268	-.3322486
_IINDX~_5_25	.0491137	.4307381	0.11	0.909	-.7951206	.8933479
_IINDXY~_6_8	.1857899	.206238	0.90	0.368	-.2184307	.5900105
_IINDXY~_6_9	.0590609	.2057199	0.29	0.774	-.3441441	.4622659
_IINDX~_6_10	.2531749	.1965579	1.29	0.198	-.132073	.6384228
_IINDX~_6_11	.2411771	.1949796	1.24	0.216	-.1409772	.6233315
_IINDX~_6_12	.246616	.1898137	1.30	0.194	-.1254133	.6186453
_IINDX~_6_13	.3042274	.1923163	1.58	0.114	-.072707	.6811617
_IINDX~_6_17	.2913089	.189633	1.54	0.124	-.0803663	.6629841
_IINDX~_6_18	.2543357	.2051461	1.24	0.215	-.1477448	.6564162
_IINDX~_6_19	.2931191	.2233772	1.31	0.189	-.1446938	.730932
_IINDX~_6_23	.017189	.3735485	0.05	0.963	-.7149553	.7493333
_IINDX~_6_25	-.4511175	.4953257	-0.91	0.362	-1.421942	.5197065
_IINDXYO~7_8	.5494733	.1382978	3.97	0.000	.2784136	.820533
_IINDXYO~7_9	.6965047	.140258	4.97	0.000	.4216032	.9714063
_IINDXY~7_10	.7082464	.1339325	5.29	0.000	.4457427	.9707502
_IINDXY~7_11	.6865984	.1333769	5.15	0.000	.4251837	.9480132
_IINDXY~7_12	.6546305	.1285139	5.09	0.000	.4027471	.9065139
_IINDXY~7_13	.6812101	.1317393	5.17	0.000	.423005	.9394152
_IINDXY~7_17	.7180214	.1285684	5.58	0.000	.4660311	.9700116
_IINDXY~7_18	.7091161	.1498423	4.73	0.000	.4154294	1.002803
_IINDXY~7_19	.7871173	.1731579	4.55	0.000	.4477327	1.126502
_IINDXY~7_23	.1424999	.3185075	0.45	0.655	-.4817656	.7667654
_IINDXY~7_25	-.0232956	.3373935	-0.07	0.945	-.6845771	.6379859
_IINDXY~_8_8	.5976738	.1175068	5.09	0.000	.3673638	.8279838
_IINDXY~_8_9	.6927778	.1195602	5.79	0.000	.4584431	.9271124
_IINDX~_8_10	.5503746	.1144872	4.81	0.000	.325983	.7747663
_IINDX~_8_11	.5212397	.1142375	4.56	0.000	.2973375	.7451419
_IINDX~_8_12	.5163492	.1099392	4.70	0.000	.3008716	.7318269
_IINDX~_8_13	.5496964	.1133068	4.85	0.000	.3276184	.7717744
_IINDX~_8_17	.5381522	.1102287	4.88	0.000	.322107	.7541973
_IINDX~_8_18	.6153364	.1340157	4.59	0.000	.3526694	.8780033
_IINDX~_8_19	.5127758	.1606254	3.19	0.001	.1979547	.8275968

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_IINDX~_8_23	-.0485844	.3403567	-0.14	0.886	-.7156736	.6185049
_IINDX~_8_25	-.5359607	.241319	-2.22	0.026	-1.008939	-.0629825
_IINDXY~_9_8	.3915429	.187285	2.09	0.037	.0244697	.758616
_IINDXY~_9_9	.3430854	.1942592	1.77	0.077	-.0376571	.7238278
_IINDX~_9_10	.5263608	.1796922	2.93	0.003	.1741693	.8785524
_IINDX~_9_11	.5591937	.176949	3.16	0.002	.2123787	.9060087
_IINDX~_9_12	.5129512	.1723576	2.98	0.003	.1751354	.850767
_IINDX~_9_13	.5736166	.1746718	3.28	0.001	.2312649	.9159682
_IINDX~_9_17	.537431	.1722236	3.12	0.002	.1998778	.8749843
_IINDX~_9_18	.5326357	.1878643	2.84	0.005	.1644272	.9008442
_IINDX~_9_19	.5704491	.205001	2.78	0.005	.1686531	.972245
_IINDX~_9_23	-.0512128	.3213293	-0.16	0.873	-.6810088	.5785832
_IINDX~_9_25	-.3599881	.2751748	-1.31	0.191	-.8993228	.1793466
_IINDXYO~0_8	.3015565	.1667065	1.81	0.070	-.0251834	.6282964
_IINDXYO~0_9	.403939	.1665287	2.43	0.015	.0775476	.7303304
_IINDXY~0_10	.3990707	.1580046	2.53	0.012	.0893863	.7087551
_IINDXY~0_11	.5101934	.1557553	3.28	0.001	.2049175	.8154694
_IINDXY~0_12	.4393947	.1507552	2.91	0.004	.1439188	.7348706
_IINDXY~0_13	.5208078	.1532933	3.40	0.001	.2203573	.8212582
_IINDXY~0_17	.5960097	.1503812	3.96	0.000	.3012669	.8907525
_IINDXY~0_18	.603344	.1674899	3.60	0.000	.2750686	.9316193
_IINDXY~0_19	.5186333	.1855341	2.80	0.005	.1549918	.8822748
_IINDXY~0_23	-.0508552	.2740635	-0.19	0.853	-.5880117	.4863012
_IINDXY~0_25	-.697511	.2323816	-3.00	0.003	-1.152972	-.2420499
_IINDXYO~1_8	.6527916	.4084335	1.60	0.110	-.1477263	1.453309
_IINDXYO~1_9	1.110786	.3991955	2.78	0.005	.3283741	1.893198
_IINDXY~1_10	1.331803	.3858426	3.45	0.001	.5755626	2.088043
_IINDXY~1_11	1.348346	.3826316	3.52	0.000	.5983993	2.098293
_IINDXY~1_12	1.309149	.3792975	3.45	0.001	.5657368	2.052561
_IINDXY~1_13	1.318041	.380598	3.46	0.001	.5720798	2.064002
_IINDXY~1_17	1.19045	.3790319	3.14	0.002	.4475581	1.933341
_IINDXY~1_18	1.115064	.3868906	2.88	0.004	.3567694	1.873358
_IINDXY~1_19	1.087584	.3951865	2.75	0.006	.31303	1.862138
_IINDXY~1_23	.6139172	.446541	1.37	0.169	-.2612902	1.489125
_IINDXY~1_25	.8035754	.424243	1.89	0.058	-.0279285	1.635079
_IINDXY~12_8	.044742	.2096801	0.21	0.831	-.366225	.455709
_IINDXY~12_9	.3928527	.2155836	1.82	0.068	-.029685	.8153903

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_IINDX~12_10	.4009731	.2052116	1.95	0.051	-.0012357	.8031818
_IINDX~12_11	.4020555	.2030859	1.98	0.048	.004013	.8000979
_IINDX~12_12	.445131	.1976262	2.25	0.024	.0577893	.8324726
_IINDX~12_13	.5237947	.1998848	2.62	0.009	.1320264	.915563
_IINDX~12_17	.492116	.1972775	2.49	0.013	.1054579	.8787742
_IINDX~12_18	.4795852	.2113782	2.27	0.023	.0652902	.8938803
_IINDX~12_19	.4220659	.226574	1.86	0.062	-.0220127	.8661444
_IINDX~12_23	-.0255578	.3141175	-0.08	0.935	-.6412191	.5901034
_IINDX~12_25	.1979357	.3065441	0.65	0.518	-.4028818	.7987532
_IINDXY~13_8	.3150266	.1664613	1.89	0.058	-.0112327	.6412859
_IINDXY~13_9	.4795865	.1704411	2.81	0.005	.1455268	.8136461
_IINDX~13_10	.2462737	.1602738	1.54	0.124	-.0678584	.5604058
_IINDX~13_11	.3358602	.1593968	2.11	0.035	.0234472	.6482732
_IINDX~13_12	.3362441	.1534824	2.19	0.028	.0354231	.6370652
_IINDX~13_13	.4192989	.1563082	2.68	0.007	.1129394	.7256584
_IINDX~13_17	.5247566	.1528405	3.43	0.001	.2251936	.8243196
_IINDX~13_18	.4746847	.1695654	2.80	0.005	.1423414	.8070279
_IINDX~13_19	.428366	.1870127	2.29	0.022	.0618265	.7949054
_IINDX~13_23	.0868598	.271901	0.32	0.749	-.4460583	.6197779
_IINDX~13_25	-.1536106	.2050517	-0.75	0.454	-.5555059	.2482848
_IINDXY~14_8	.5554919	.1297143	4.28	0.000	.3012557	.8097281
_IINDXY~14_9	.7376648	.1326356	5.56	0.000	.4777029	.9976267
_IINDX~14_10	.7156164	.1264613	5.66	0.000	.4677558	.9634769
_IINDX~14_11	.7293871	.1261279	5.78	0.000	.4821801	.9765941
_IINDX~14_12	.7101799	.1211764	5.86	0.000	.4726776	.9476821
_IINDX~14_13	.8541677	.1242252	6.88	0.000	.6106899	1.097645
_IINDX~14_17	.9541532	.1210023	7.89	0.000	.7169922	1.191314
_IINDX~14_18	.9693197	.1417837	6.84	0.000	.6914277	1.247212
_IINDX~14_19	.8537133	.1631547	5.23	0.000	.5339348	1.173492
_IINDX~14_23	.4139993	.2610418	1.59	0.113	-.097635	.9256337
_IINDX~14_25	.5495357	.1519188	3.62	0.000	.2517792	.8472923
_IINDXY~15_8	.3579792	.11972	2.99	0.003	.1233314	.592627
_IINDXY~15_9	.430042	.1221763	3.52	0.000	.19058	.669504
_IINDX~15_10	.2006953	.1162702	1.73	0.084	-.027191	.4285815
_IINDX~15_11	.1956156	.1160513	1.69	0.092	-.0318416	.4230728
_IINDX~15_12	.174804	.1115499	1.57	0.117	-.0438305	.3934386

_IINDX~15_12	.174804	.1115499	1.57	0.117	-.0438305	.3934386
_IINDX~15_13	.2729904	.1150969	2.37	0.018	.0474037	.498577
_IINDX~15_17	.2576427	.1118854	2.30	0.021	.0383506	.4769347
_IINDX~15_18	.2952473	.137942	2.14	0.032	.0248851	.5656096
_IINDX~15_19	.1927917	.1754716	1.10	0.272	-.1511275	.536711
_IINDX~15_23	-.0123171	.4040305	-0.03	0.976	-.8042052	.779571
_IINDX~15_25	.3925326	.3680233	1.07	0.286	-.3287824	1.113847
_IINDXY~16_8	.1900631	.1201211	1.58	0.114	-.0453707	.425497
_IINDXY~16_9	.285035	.1230011	2.32	0.020	.0439564	.5261136
_IINDX~16_10	.3000452	.1171361	2.56	0.010	.0704618	.5296286
_IINDX~16_11	.2911563	.1168997	2.49	0.013	.0620363	.5202763
_IINDX~16_12	.2784816	.1119272	2.49	0.013	.0591076	.4978557
_IINDX~16_13	.3626037	.1154095	3.14	0.002	.1364045	.588803
_IINDX~16_17	.3688816	.1119526	3.29	0.001	.1494578	.5883054
_IINDX~16_18	.3369035	.1354183	2.49	0.013	.0714876	.6023194
_IINDX~16_19	.3133539	.1582704	1.98	0.048	.0031485	.6235593
_IINDX~16_23	-.1351142	.2696349	-0.50	0.616	-.6635908	.3933624
_IINDX~16_25	-.3961575	.2383851	-1.66	0.097	-.8633853	.0710703
_IINDXY~98_8	.1964567	1.104956	0.18	0.859	-1.969225	2.362139
_IINDXY~98_9	1.517292	1.274848	1.19	0.234	-.9813736	4.015957
_IINDX~98_10	.4220539	1.104863	0.38	0.702	-1.743446	2.587554
_IINDX~98_11	-.4213497	.9891982	-0.43	0.670	-2.36015	1.51745
_IINDX~98_12	-.1796687	.9887773	-0.18	0.856	-2.117644	1.758306
_IINDX~98_13	-.6066105	.9891256	-0.61	0.540	-2.545268	1.332047
_IINDX~98_17	-.2902601	.9470998	-0.31	0.759	-2.146548	1.566028
_IINDX~98_18	-.0111869	1.011626	-0.01	0.991	-1.993945	1.971571
_IINDX~98_19	.4504129	1.27876	0.35	0.725	-2.05592	2.956746
_IINDX~98_23	(omitted)					
_IINDX~98_25	(omitted)					
_IINDXY~99_8	(omitted)					
_IINDXY~99_9	(omitted)					
_IINDX~99_10	(omitted)					
_IINDX~99_11	(omitted)					
_IINDX~99_12	(omitted)					
_IINDX~99_13	(omitted)					
_IINDX~99_17	(omitted)					
_IINDX~99_18	(omitted)					
_IINDX~99_19	(omitted)					
_IINDX~99_23	(omitted)					
_IINDX~99_25	(omitted)					
_cons	3.812552	.0924392	41.24	0.000	3.631374	3.99373

Finally, we tested the interaction of the dummy variable for residence in Quebec and years of schooling. The corresponding xi regression with YOSCHOOLING* PROVP_QUEBEC gave similar responses to the hyposteses as did our OLNP regression. Both terms are highly correlated. We believe that since the population of French speakers in Canada and the population of people in Quebec are nearly identical, it stands to reason that the 2 variables would be directly correlated.

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. xi:reg LNWAGESP LNWKSPWKP LNHRSW0KP i.YOSCHOOLING*i.PROVP_QUEBEC
i.YOSCHOOLING     _IYOSCHOOLI_5-25    (naturally coded; _IYOSCHOOLI_5 omitted)
i.PROVP_QUEBEC    _IPROVP_QUE_0-1     (naturally coded; _IPROVP_QUE_0 omitted)
i.Y~ING*i.PRO~C   _IYOSXPRO_#_#       (coded as above)
```

Source	SS	df	MS		
Model	167371.439	25	6694.85754	Number of obs =	337620
Residual	294160.017337594	337594	.871342549	F(25,337594) =	7683.38
				Prob > F =	0.0000
				R-squared =	0.3626
				Adj R-squared =	0.3626
Total	461531.455337619	337619	1.36701861	Root MSE =	.93346

LNWAGESP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LNWKSPWKP	1.00266	.0036587	274.05	0.000	.9954888	1.009831
LNHRSW0KP	.7070666	.003428	206.26	0.000	.7003479	.7137854
_IYOSCHOO~_8	.0922048	.0269003	3.43	0.001	.039481	.1449287
_IYOSCHOO~_9	.0559024	.0272835	2.05	0.040	.0024276	.1093773
_IYOSCHOO~10	.0743335	.0253633	2.93	0.003	.024622	.1240449
_IYOSCHOO~11	.0489081	.0252924	1.93	0.053	-.0006642	.0984804
_IYOSCHOO~12	.1707191	.0244331	6.99	0.000	.122831	.2186071
_IYOSCHOO~13	.1940319	.0247737	7.83	0.000	.1454761	.2425876
_IYOSCHOO~17	.4490066	.0243441	18.44	0.000	.4012929	.4967202
_IYOSCHOO~18	.5882323	.0252187	23.33	0.000	.5388044	.6376602
_IYOSCHOO~19	.7919572	.0257475	30.76	0.000	.7414927	.8424216
_IYOSCHOO~23	.9323936	.0328408	28.39	0.000	.8680266	.9967606
_IYOSCHOO~25	.832733	.0375325	22.19	0.000	.7591703	.9062956
_IPROVP_QU~1	-.0674575	.0389126	-1.73	0.083	-.1437251	.0088102
_IYOSXP~_8_1	.0210799	.0434024	0.49	0.627	-.0639876	.1061475
_IYOSXP~_9_1	.0431895	.0443842	0.97	0.331	-.0438023	.1301812
_IYOSXPR~0_1	.0425975	.0423435	1.01	0.314	-.0403946	.1255895
_IYOSXPR~1_1	.1251912	.0411471	3.04	0.002	.0445441	.2058384
_IYOSXPR~2_1	.0722234	.0402305	1.80	0.073	-.0066272	.151074
_IYOSXP~13_1	.0386919	.0401943	0.96	0.336	-.0400878	.1174716
_IYOSXPR~7_1	.0093045	.0394393	0.24	0.813	-.0679955	.0866045
_IYOSXP~18_1	.0437302	.0410593	1.07	0.287	-.0367449	.1242052
_IYOSXP~19_1	.0581904	.0433305	1.34	0.179	-.0267362	.1431169
_IYOSXP~23_1	.0843622	.0617521	1.37	0.172	-.03667	.2053945
_IYOSXPR~5_1	.0701028	.0698018	1.00	0.315	-.0667066	.2069123
_cons	3.39646	.0287257	118.24	0.000	3.340159	3.452762

Concluding remarks

Summary of model results

Language known	change in Earnings (LNWAGE) outside Quebec for an additional year of school	change in Earnings (LNWAGE) in Quebec for an additional year of school
English	0.642	0.315
French	0.633	0.306
Both Languagues	0.726	0.395

When examining the results of these regressions, it is clear that the interaction terms for years of schooling and language always show a higher coefficient for the English speakers than for French speakers. It is also worth mentioning the negative coefficient for the Quebec province dummy variable. It can be argued that this variable works as a proxy for French speakers (considering the demographics of Quebec). Taking all of this evidence into account, it can be concluded that the returns to education are higher for English speakers than for French speakers.

It is hard to know all the factors that lead to this language "discrimination". Perhaps, the most important reason for this difference is that English speakers are the majority in Canada (roughly 80% against 20% French). This is a reason for employers to hire English speakers rather than French speakers. In addition, there are a higher percentage of native French speakers that speak English than native English speakers that speak French. This reinforces the relevance of English. Since Canada is 80% English, this likely increases the chances of getting a job in an English-speaking city (such as Toronto, Vancouver, Calgary, etc).