Los retornos económicos del lenguaje en Belice: evidencia para el censo de 2000

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Resumen

El inglés es el idioma oficial de Belice que se utiliza en la conducción de los asuntos oficiales del gobierno y como estándar en la educación pública. Sin embargo, el inglés no es el idioma principal que se habla en los hogares beliceños ni en la realización de transacciones comerciales locales. Belice es una nación políglota que incluye lenguas europeas, lenguas nativas y lenguas criollas. En este artículo, demostramos los rendimientos económicos de la adquisición y el uso del idioma en Belice utilizando datos del censo de 2000.

Nuestros resultados indican que Belice recompensa principalmente la capacidad de comunicarse en inglés y español. Otras habilidades lingüísticas también son importantes, como la capacidad de hablar alemán, hablar maya, inglés o español, y la capacidad de hablar en combinación criollo-español-inglés. Hay una sanción salarial severa asociada con hablar maya y garífuna. También se exploran otras variables endógenas y exógenas no relacionadas con el lenguaje.

Palabras claves: *Rendimiento Económico de la Adquisición de Idiomas, multilingüismo, bilingüismo, Belice*

JEL: Z13, O54, J3

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The economic returns to language in Belize: evidence from the 2000 census

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Abstract:

English is the official language of Belize used in the conduct of official government business and as the standard in public education. However, English is not the primary language spoken in Belizean households nor in the conduct of local business transactions. Belize is a polyglot nation inclusive of European-based languages, native languages, and creole languages. In this paper, we demonstrate the economic returns to language acquisition and usage in Belize using census 2000 data.

Our results indicate that Belize primarily rewards the ability to communicate in English and Spanish. Other language skills are also important, such as the ability to speak German, to speak Maya and English or Spanish, and the ability to speak in combination Creole-Spanish-English. There is a severe wage penalty associated with the speaking of Maya and Garifuna. Other non-language endogenous and exogenous variables are also explored.

Key Words: *Economic Returns to Language Acquisition, multilingualism, bilingualism, Belize*

JEL: Z13, O54, J3

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I Introduction

Belize is a young, democratic, and peaceful Central American country bordered by land with Guatemala to the west, Mexico to the north, and with Honduras across the Bay of Honduras to the southeast. In the year 2000, the population of Belize was 249,800 (CSO, 2001) inhabiting a land just a little larger than the size of Massachusetts or El Salvador. Belize achieved its independence from Great Britain in 1981 after centuries of colonial rule. The primary economic drivers in Belize are tourism and agriculture (Avila & Pisani, 2021). The cultural and political disposition of Belize lies uniquely at the convergence of Central America and the Caribbean (Pisani & Pisani, 2007).

Belize is a multi-lingual, multi-cultural, and multi-ethnic society (Shoman, 1994, Barnettt, 2001). This statement comes as no surprise to those who live in or travel to the "Jewel." From Creole to German, and Garifuna to Spanish, a multitude of languages are heard and spoken throughout the nation (CSO, n.d.). What may be more surprising are the economic returns associated with language use in Belize. The 2000 Belize Census collected information regarding ten languages in Belize (see Table 1).

Coupled with reported wage data, a review of wages and language ability suggests that English was the most economically prized language with the indigenous Maya languages least economically valued in 2000. These differences are significant. While the census asked respondents to identify their first language spoken at home as well as their current language spoken at home, the hierarchy (or ranking) of languages and their returns remained unchanged between the two sets.[1]

Table 1	Hourly Wage by First and Current Language Spoken at Home		
Variable	**Mean ($)**	**Standard Deviation**	**N**
First Language Spoken at Home			
Chinese	7.41	(5.54)	361
Creole	6.55	(9.36)	16,930
English	9.22	(9.73)	2,416
Garifuna	6.70	(8.98)	2,544
German	5.98	(7.49)	1,631
Hindu	7.81	(5.97)	80
Maya Ketchi	2.79	(3.49)	2,434
Maya Mopan	3.14	(5.95)	1,713
Maya Yucatec	4.41	(8.67)	425
Spanish	4.66	(5.38)	28,506

1   This ranking between the two (the first language spoken and the current language spoken) takes into consideration that the first language spoken does not necessarily dictate one's current spoken language. Nevertheless, the hierarchical economic returns to language is an enduring personal cultural artifact in Belize.

Table 1	Hourly Wage by First and Current Language Spoken at Home		
Other	8.70	(8.30)	278
Don't Know/Not Stated	4.29	(3.43)	45
Total	**5.45**	**(7.30)**	**57,363**
Current Language Spoken at Home			
Chinese	7.31	(5.39)	345
Creole	6.48	(8.80)	19,928
English	9.14	(10.23)	3,925
Garifuna	6.56	(10.07)	1,302
German	5.74	(5.59)	1,563
Hindu	6.65	(5.12)	51
Maya Ketchi	2.46	(3.01)	2,146
Maya Mopan	2.85	(6.47)	1,399
Maya Yucatec	3.48	(4.69)	185
Spanish	4.40	(5.03)	26,311
Other	8.69	(11.20)	187
Don't Know/Not Stated	4.29	(3.25)	21
Total	**5.45**	**(7.30)**	**57,363**

ANOVA F=246.757, df = 11, p= .000
Source: Census 2000, authors' calculations.

Utilizing comprehensive census 2000 data as well as a focused country-wide survey (N=448) undertaken in 2006, we seek to better understand the economic returns to language use in Belize at that time. Fundamentally, what is the economic value (i.e., returns) to language facility in Belize? The remainder of this paper is divided into the following sections: literature review, methodology, results, discussion, and conclusion.

II. Literature review

Much has been written about the ethnic composition and characteristics of Belize (see for example Sutherland 1998; Woods, Perry, & Stegall, 1997; Barry, 1995). Bolland (2003, p. 204) suggested that "one of the most striking features of Belize is its cultural diversity." Shoman (1994, p. 259) argued that Belize is a product of the "world imperial system" which "brought peoples [voluntarily and involuntarily] from all over the world" to Belize. In essence, Belize is "the house that [British] Empire built" (Shoman, 1994, p. 278), in part based upon slave labor.

The 2000 census provides a backdrop of the ethnic and linguistic composition of the nation (see Table 2) in the early 21st century. Three ethnic groups—Creoles, Maya, and Mestizos— made up 84.2% of the total population. The corresponding languages of Creole, Maya (Ketchi, Mopan and Yucatecan), and Spanish comprised 87.8% of the languages spoken at home throughout Belize in the year 2000. The Creole language was born out of the movement of slaves from West Africa to the British colony of British Honduras (now Belize) where West African languages melded with English (Salmon, 2015).

Interestingly, while English is the official national language, it is a minority language in the home with Creole generally considered the national lingua franca (Balam & de Prada Pérez, 2017). The politics of language instruction in schools, particularly bilingual education, have yet to fully play themselves out in the national dialogue (Young 2002; Newport 2004) though Spanish is ensconced in the public schools (Balam & de Prada Pérez, 2017).

Table 2	Ethnicity and Language Spoken at Home in Belize in 2000	
A) Ethnicity	**Number**	**Percent**
Black/African	532	0.2
Caucasian/White	1,758	0.8
Chinese	1,716	0.7
Creole	57,859	24.9
East Indian	6,858	2.9
Garifuna	14,061	6.1
Maya	24,561	10.6
Mennonite	8,276	3.6
Mestizo/Spanish	113,045	48.7
Other	3,445	1.5
Total	**232,111**	**100.0**
B) Language Spoken at home	**Number**	**Percent**
Chinese	1,607	0.8
Creole	67,527	32.9
English	7,946	3.9
Garifuna	6,929	3.4
German	6,783	3.3
Hindi	280	0.1
Maya	18,227	8.9
Spanish	94,422	46.0
Other	1,402	0.7
Total	**205,123**	**100.0**

Source: CSO (n.d.)

Concerning the ethnic and linguistic distribution, Ergood (1994, p. 8) suggested "numeric dominance translates into political power and linguistic dominance translates into ethnic identity. But ethnic power translates into trouble for Belize." In short, Ergood implied trouble may be on the horizon for Belize as the demographic and linguistic transition towards Spanish and mestizaje plays out. However, Bolland (2003, p. 217) noted an absence "of violence between ethnic groups in Belize."

We believe that with the Hispanization of Belize came tensions as pedantic as cuisine (Wilk, 2007; 1999) and as critical as language use and identity (Enriquez, 2006) and social relations (Daugaard-Hansen, 2005). Haug (1998) reminded us that ethnicity is not always easy to categorize in plural and mixed societies such as Belize.

Hence, caution should be utilized when reading well-delimited groupings. Nevertheless, language proficiency is not bound by ethnic affiliation and is much easier to assess.

The literature on language and earnings suggests several interesting frameworks and findings (Dávila, Pisani, & Miranda, 2021). Individuals with multiple language proficiencies ought to receive high returns according to human capital theory. This human capital rationale was reinforced by a U.S. study of bilingual (English and Spanish) nurses where wage premiums were associated with bilingualism (Kalist, 2005).

Furthermore, using US 2000 census data comparing Hispanics who were bilingual (English and Spanish) against Hispanics that were monolingual English speakers, Cortina et al. (2008) found a 2.7% wage premium for bilingualism. In a recent study from Mexico, ethnically indigenous males who are bilingual with Spanish and an indigenous language earned a five percent wage premium over monolingual indigenous males (de la Fuente Stevens & Pelkonen, 2023).

Wage premiums have also been found among bilinguals in Catalonia, Spain (Catalan-Spanish) driven by bilingual education adopted through public policy (Cappellari & Di Paolo, 2018).

However, not all multilingual outcomes may result in a gain in earnings. In a recent study of bilinguals in the United States using census data revealed a small wage penalty vis-à-vis monolingual English speakers (Churkina et al., 2023). To the extent that language ability "signals" ethnicity or place of origin, language as a variable may lead to labor market discrimination (Dávila & Mora, 2013). Accent may also be viewed as repulsive to some employers (or customers if self-employed) and that it may stigmatize (Gluszek & Dovidio, 2010) and may adversely impact business outcomes and earnings (Dávila, Bohara, & Saenz, 1993), or employment opportunities (Carlson & McHenry, 2006).

Aldashev and Danzer (2020) focus on the returns to Russian and Kazakh languages in Kazakhstan before and after the fall of the Soviet Union in two cities and find mixed language premia and penalties for bilinguals suggesting that in-country regional differences matter. In bilingual Paraguay, households that speak Guaraní at home earn substantially less, have fewer social benefits (including formal sector work), and are less likely to be entrepreneurs, than households that speak Spanish at home (Pisani & Ovando, 2019).

At the national level, McManus, Gould and Welch (1983) found that the lack of fluency in a nation's majority language reduces trade and production opportunities. Belize does not have a dominant language, though Creole and Spanish are certainly the languages of commerce. Grenier (1984) argued that workers with limited English proficiency in the United States may not be able to navigate adeptly the labor market and thus may accept below optimal employment.

Within Belize, a lack of English proficiency may create information (and employment) asymmetries especially when trying to access governmental and education-related employment. Tienda and Neidert (1984) noted that occupational crowding may be the result of poor English-speaking ability in the United States, creating a situation where there are many more job applicants for similar type of work which is English language neutral. Agricultural work in Belize is often language neutral (such as the banana and sugar harvests) because it attracts many migrant workers from surrounding countries. Lastly, limited language proficiency may be used as an open discriminatory employment tactic (Phillips & Massey, 1999).

Institutional discrimination of indigenous languages in Belize is the norm rather than the exception. Perhaps related, Mora and Dávila (2006; 2004) identified earnings penalties (and rewards) for language use along the US-Mexican border. They suggested the dynamic border labor market creates heterogeneous earnings outcomes for various groups, but that language acquisition and ability is still a primary indicator of earnings.

Given the literature on language and earnings as well as the unique linguistic make-up of Belize, we offer the following two research questions.

- **Research Question 1: Of the main languages spoken in Belize, which language offered the highest economic returns in 2000?**
- **Research Question 2: As English was the single unifying language of education and government, what language ought to be the second language of Belize?**

III. Methodology

Two sources of data provide the statistics employed in this study. The first data set utilized micro-level data obtained from the entire Belize Census 2000 undertaken during May 2000 by the Central Statistical Office.[2] Since we were concerned with the economic returns to language, only those census respondents reporting earnings were included in the study (N=59,011). The variables of interest included the dependent variable earnings (calculated from the income flashcard) as well as the predictor or independent variables.

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2   The Central Statistical Office is now the Statistical Institute of Belize. The quality of the census data and data set are considered excellent. The 2000 census is the latest available data to the authors. The 2022 census is not yet publicly available. The 2010 census is completed but has not been released to the authors in a decade of formal research requests. Nevertheless, we believe the 2000 census is a rich and valuable source of data for examining the economic returns to language acquisition in Belize. When further census data is available, we endeavor to update this research.

The independent variables are, with variable coding appear in parentheses, gender (female=0, male=1), age (in years), education (highest categorical level completed), birthplace (born outside of Belize=0, born in Belize=1), residence (urban/rural [rural=0, urban=1] and district [by district category]), language proficiency (speak not so well/speak barely/speak not at all=0, speak well=1, by language), weekly hours worked (number of hours), ethnicity (self-reported by ethnic category), and civil status (married=1, single=2, divorced/separated/widowed=3).

The census 2000 asked respondents to rate their proficiency in Spanish and English, but not the other identified languages (Chinese, Creole, Garifuna, German, Hindi, and Maya). While the census allowed for four possible responses to Spanish and English language facility (speak very well, speak not so well, speak barely/not at all, don't know/not stated), we partitioned language facility dichotomously: speak well versus all other responses as coded above. To be fluent requires a spoken mastery.

In addressing the limitations provided with the study of Chinese, Creole, Garifuna, German, Hindi, and Maya, we created a proxy variable for each language according to language ability by combining the "first language spoken" and "current language spoken at home" variables. We believe that the first language spoken is an enduring cultural artifact facilitating the same language ability later in life. We also suggest that the respondent indicating the current language spoken at home must have facility in that language.

However, we believe our proxies for these languages undercount those Belizeans who learned Chinese, Creole, Garifuna, German, Hindi, and Maya away from home, but the census data does not allow any better recourse. We preferred to err on the conservative side. Perhaps in future rounds of census taking, explicit questions of language facility and all languages spoken in Belize shall provide more precision. We also partitioned these languages as dichotomous variables along the lines of the English and Spanish language variables reported above.

We utilize multiple regression to uncover the economic returns to language estimated using SPSS version 26.0 software. Multiple regression is a widely used and foundational statistical technique to analyze the relationship between a single dependent variable and several independent variables (Hair et al., 1995). In our multiple regression models which follow, a minimum cell count of 250 was required to undertake sound analyses. As such Hindi was dropped from further exploration, the three Maya languages were combined into a single variable, and bilingual and trilingual dyads and triads were reduced to meet this restriction.

The second source of data derived from our own nation-wide survey conducted in the spring of 2006 with the assistance of the Belizean Studies Resource & Data Processing Center of St. John's College Junior College in Belize City. In February 2006, the survey instrument was pilot tested with 50 Belizeans from diverse backgrounds and regions to ensure readability and clarity of questions. After minor adjustments to the survey, trained and paid interviewers from the Belizean Studies Resource Center obtained a nation-wide random sample of 448 respondents. The two-page survey contained, in part, questions regarding demographics and language ability and language preference utilized for this present study. Germane to our current study and second research question, we asked "Which second language should be required of all Belizeans?"

Beyond the reporting of descriptive statistics, we employ multiple linear regression to empirically address the economic returns to language acquisition and usage. Alternate non-parametric tests were conducted regarding the preferred second language national choice.

IV. Results

The results are reported in two parts, demarcated by our research questions: 1) Of the main languages spoken in Belize, which language offered the highest economic returns in 2000? And 2) As English is the single unifying language of education and government, what language ought to be the second language of Belize? A discussion of the results follows in the next section of the paper.

4.1 The Economic Returns to Language in Belize

In order to determine the economic returns to language acquisition and usage, respondents who reported positive earnings in the Belize Census 2000 data were employed. The descriptive statistics for the 59,011 Belizeans who met this condition are reported in Table 3. The mean hourly derived wage was $5.45.[3] Just over seventy percent of the sample was male with a mean age of 34.4 years. Nearly three-quarters of the sample possessed an eighth-grade education or less with about the same percentage born in Belize. The sample was nearly evenly divided between rural and urban habitations with district residence following the national pattern with the district of Belize the most heavily represented.

Two-thirds of the sample were married and on average worked fulltime (44.3 hours per week). Additionally, the ethnic composition mirrored the national profile with Hispanics (a summation category of mestizos and Spaniards) the numerically largest ethnic group followed by Creoles (encompassing Creoles, Africans and Blacks), and Maya (comprised of Ketchi, Mopan, and Yucatecan Maya).

Table 3	Descriptive Statistics		
Variables		**Value**	**N**
Mean Hourly Wage (std. dev.)		5.45 (7.30)	57,363
Gender (%)			
Male		70.9	41,819
Female		29.1	17,192
Mean Hourly Wage (std. dev.)		34.4 (13.1)	59,011

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3   All monetary figures used in the paper are reported in Belizean dollars. At the time of the 2000 Census, the exchange rate between the Belizean dollar and the US dollar was fixed at two Belize dollars equal to one US dollar.

Table 3   **Descriptive Statistics**

Education (%)		
Less than eighth grade	32.0	18,390
Eighth grade	42.1	24,193
High school	14.5	8,314
Junior College (AA)	7.8	4,486
Four-year College (BA)	2.7	1,559
Graduate School (MA/Ph.D.)	0.9	544
Birthplace (%)		
Belize	76.6	45,188
Outside Belize	23.4	13,819
Urban/Rural Residence (%)		
Urban	47.7	27,872
Rural	52.3	30,592
District Residence (%)		
Belize	27.5	16,217
Corozal	15.3	9,000
Orange Walk	16.4	9,698
Cayo	19.0	11,212
Stann Creek	12.7	7,518
Toledo	9.1	5,366
Language Proficiency (%)		
Chinese	0.7	399
Creole	29.5	17,411
English	61.5	36,305
Garifuna	4.5	2,669
German	2.9	1,688
Maya	7.9	4,690
Spanish	60.1	35,464
Mean Hours Worked (week) (std. dev.)	44.3 (14.2)	57,363
Ethnicity (%)		
Caucasian/White	0.9	544
Chinese	0.7	414
Creole/African	23.5	13,812
East Indian	3.4	1,984
Garifuna	6.5	3,833
Hispanic (Mestizo/Spanish)	52.1	30,660

Table 3	Descriptive Statistics		
Maya		9.1	5,326
Mennonite		2.8	1,667
Other		1.0	599
Civil Status (%)			
Married		65.5	38,604
Single		32.1	18,936
Divorced/Separated/Widowed		2.4	1,416

Source: Census 2000, authors' calculations.

For language, the census questionnaire asked four pertinent questions: 1) "What was the first language you spoke at home as a child?" 2) "Currently what is the language you most commonly use at home?" 3) "How well do you speak Spanish?" and 4) "How well do you speak English?" With these four questions, we were able to derive seven single language variables as argued above in the methodology section. English, Spanish, Creole, and Maya were the four most spoken languages in our sample. These seven language classifications were distinct yet not mutually exclusive for each case.

The census data reported the first language spoken and the current language spoken at home. The uncorrected hourly mean wages by first and current language spoken at home are reported in Table 1. Only two first-learned languages fell below the national hourly mean ($5.45) —Maya ($3.72 average of all Maya) and Spanish ($4.66). On the opposite pole, English ($9.22) and Chinese ($7.41) were the first-learned languages with the highest uncorrected remuneration. In all, the returns for monolinguals are significantly different as indicated by means testing (see reported F statistics in Table 1).

For monolingual Spanish and Maya speakers, the acquisition of new languages ameliorated the dampening effect of below national average earnings. Two bilingual pairs—Spanish and Maya and English and Maya— modestly increased (on average from 8.6% to 10.6%, respectively) hourly earnings for Maya speakers (see Table 4). Trilingual Maya speakers (including English and Spanish) substantially increased their hourly earnings by 23.1%, but trilingual Maya speakers still earned 11.1% below the national average.

 A comparison of means demonstrates that bilingual pairs and trilingual triads significantly differed from one another in their respective sub-groups as well as in their entirety (see reported F statistics in Table 4). All of the other bilingual and trilingual combinations exceeded the national mean hourly earnings. There were no quadrilingual groupings with the minimum 250 cell count requirement. Median hourly wages by language pairings are also reported in Table 4.[4] We next turn to multiple regression results which controls for the influence of other variables.

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4   We thank an anonymous reviewer for recommending the addition of the median wage column in Table 4.

Table 4	Hourly Wage – Bilingualism & Multilingualism in Belize			
Variables	**Mean ($)**	**Standard Deviation**	**N**	**Median ($)**
Bilingual Language Dyads				
Creole – English	6.68	(7.33)	14,894	4.83
Creole – Spanish	6.84	(7.25)	3,421	5.00
English – Garifuna	7.17	(9.55)	2,030	5.10
English – German	7.25	(9.72)	692	5.51
English – Maya	4.16	(6.82)	1,999	3.06
Spanish – English	6.05	(6.65)	19,224	4.29
Spanish – Garifuna	6.45	(7.38)	676	4.50
Spanish – German	6.10	(4.88)	497	4.83
Spanish – Maya	4.07	(8.55)	1,102	2.81
Bilingual Dyads: ANOVA F=49.629, df = 8, p= .000				
Trilingual Language Triads				
Creole – English – Spanish	6.99	(7.38)	3,202	5.00
English – Garifuna – Spanish	7.20	(8.24)	497	5.00
English – German – Spanish	6.71	(5.37)	256	5.31
English – Maya – Spanish	4.84	(10.70)	630	3.38
Trilingual Triads: ANOVA F=13.237, df = 3, p= .000 Bilingual Dyads & Trilingual Triads: ANOVA F=37.591, df = 12, p= .000				

Source: Census 2000, authors' calculations. A minimum cell count of 250 was required for reporting and statistical purposes.

Both endogenous (i.e., human capital) and exogenous (i.e., labor market) variables influence earnings—hourly earnings in our multiple regression models. The census data permits the use of the following control variables: gender, age, education, birthplace, residence (urban versus rural and district location), the number of hours worked per week, ethnicity, civil status, and language proficiency.

We undertook three multiple regression estimations looking at monolingualism, bilingualism, and multilingualism adding one layer of language acquisition during each estimation stage (see Tables 5-7). Each multiple regression model was significant and explained nearly one-fifth of the earnings variance. Multicollinearity tests for each multiple regression model were within acceptable limits where nearly all variance inflation factor (VIF) values were less than 2 and with most values in the correlation matrix under 0.3.

Table 5	Multiple Regression Results for Hourly Wages & Monolingualism			
Variables	**β**	**Std. Error**	**t– statistic**	**Significance**
Constant	9.202	.188	49.020	.000***
Male	.819	.066	12.440	.000***
Age	.029	.002	12.040	.000***
Education^	---	---	---	---
Less than eighth grade	-.618	.072	-8.618	.000***
High school	1.366	.088	15.539	.000***
Junior College (AA)	2.861	.111	25.764	.000***
Four-year College (BA)	6.265	.178	35.198	.000***
Graduate School (MA/Ph.D.)	7.962	.294	27.100	.000***
Born in Belize	.247	.082	3.000	.003***
Urban	.796	.067	11.850	.000***
District Residence^	---	---	---	---
Corozal	-1.132	.106	-10.686	.000***
Orange Walk	-1.134	.102	-11.130	.000***
Cayo	-.588	.091	-6.456	.000***
Stann Creek	-.187	.106	-1.765	.078*
Toledo	-1.212	.132	-9.154	.000***
Hours Worked (weekly)	-.141	.002	-69.552	.000***
Ethnicity^	---	---	---	---
Caucasian/White	2.229	.326	6.844	.000***
Chinese	1.319	.743	1.777	.076*
Creole/African	.627	.126	4.982	.000***
East Indian	.453	.181	2.500	.012**
Garifuna	.202	.222	.909	.363
Maya	-.112	.205	-.548	.584
Mennonite	.974	.628	1.550	.121
Other	1.564	.294	5.324	.000***
Civil Status^	---	---	---	---
Single	-1.077	.066	-16.437	.000***
Divorced/Separated/Widowed	-.608	.188	-3.236	.001***
Language Proficiency	---	---	---	---
Chinese	1.137	.754	1.507	.132

Table 5	Multiple Regression Results for Hourly Wages & Monolingualism			
Creole	-.141	.118	-1.194	.232
English	.641	.071	9.079	.000***
Garifuna	-.187	.250	-.750	.453
German	1.423	.625	2.277	.023**
Maya	-1.183	.229	-5.176	.000***
Spanish	.451	.093	4.837	.000***

Model Statistics: Adjusted R2 = .176; df = 32; F = 368.429, p= .000

^ The reference categories include education (eighth grade), district residence (Belize), ethnicity (Hispanic= Mestizo/Spanish), and civil status (married) and were chosen on the basis of the largest categorical group. ***, **, * represent statistical significance at the .001, .05, and .10 levels, respectively.
Source: Census 2000, authors' calculations.

Table 6	Multiple Regression Results for Hourly Wages & Bilingualism			
Variables	**β**	**Std. Error**	**t– statistic**	**Significance**
Constant	9.899	.283	34.934	.000***
Male	.815	.068	12.382	.000***
Age	.029	.002	11.960	.000***
Education^	---	---	---	---
Less than eighth grade	-.609	.072	-8.426	.000***
High school	1.371	.088	15.583	.000***
Junior College (AA)	2.880	.111	25.893	.000***
Four-year College (BA)	6.257	.178	35.093	.000***
Graduate School (MA/Ph.D.)	7.976	.294	27.151	.000***
Born in Belize	.218	.084	2.586	.010***
Urban	.797	.068	11.804	.000***
District Residence^	---	---	---	---
Corozal	-1.102	.106	-10.377	.000***
Orange Walk	-1.110	.102	-10.874	.000***
Cayo	-.617	.091	-6.746	.000***
Stann Creek	-.180	.106	-1.693	.090*
Toledo	-1.061	.135	-7.871	.000***
Hours Worked (weekly)	-.142	.002	-69.757	.000***
Ethnicity^	---	---	---	---

Table 6	Multiple Regression Results for Hourly Wages & Bilingualism			
Caucasian/White	1.777	.339	5.250	.000***
Chinese	1.077	.744	1.448	.148
Creole/African	.509	.130	3.925	.000***
East Indian	.268	.185	1.453	.146
Garifuna	.016	.225	.071	.944
Maya	-.020	.207	-.097	.922
Mennonite	.912	.634	1.438	.150
Other	1.300	.299	4.349	.000***
Civil Status^	---	---	---	---
Single	-1.097	.066	-16.721	.000***
Divorced/Separated/Widowed	-.627	.188	-3.341	.001***
Language Proficiency	---	---	---	---
Chinese	.758	.761	.996	.319
Creole	-.162	.262	-.616	.538
English	.574	.220	2.611	.009***
Garifuna	-.768	.387	-19.87	.047**
German	.605	.658	.883	.377
Maya	-2.671	.328	-8.139	.000***
Spanish	-2.03	.232	-.875	.382
Bilingual: Creole – English	-.578	.247	-2.343	.019**
Bilingual: Creole – Spanish	.877	.208	4.213	.000***
Bilingual: English – Garifuna	.372	.343	1.087	.277
Bilingual: English – German	.930	.374	2.485	.013**
Bilingual: English – Maya	1.131	.264	4.294	.000***
Bilingual: Spanish – English	-.010	.216	-.045	.964
Bilingual: Spanish – Garifuna	.183	.342	.537	.591
Bilingual: Spanish – German	.295	.400	.737	.461
Bilingual: Spanish – Maya	1.587	.297	5.342	.000***

Model Statistics: Adjusted R2 = .177; df = 41; F = 290.416, p= .000

^The reference categories include education (eighth grade), district residence (Belize), ethnicity (Hispanic= Mestizo/Spanish), and civil status (married) and were chosen on the basis of the largest categorical group. ***, **, * represent statistical significance at the .001, .05, and .10 levels, respectively. Source: Census 2000, authors' calculations.

Table 7	**Multiple Regression Results for Hourly Wages & Multilingualism**			
Variables	**β**	**Std. Error**	**t– statistic**	**Significance**
Constant	9.727	.329	28.691	.000***
Male	.815	.066	12.390	.000***
Age	.029	.002	11.939	.000***
Education^	---	---	---	---
Less than eighth grade	-.609	.072	-8.421	.000***
High school	1.372	.088	15.593	.000***
Junior College (AA)	2.879	.111	25.855	.000***
Four-year College (BA)	6.250	.178	35.044	.000***
Graduate School (MA/Ph.D.)	7.969	.294	27.123	.000***
Born in Belize	.221	.085	2.618	.009***
Urban	.798	.068	11.805	.000***
District Residence^	---	---	---	---
Corozal	-1.105	.106	-10.388	.000***
Orange Walk	-1.106	.102	-10.823	.000***
Cayo	-.617	.091	-6.745	.000***
Stann Creek	-.175	.106	-1.644	.100*
Toledo	-1.055	.135	-7.830	.000***
Hours Worked (weekly)	-.142	.002	-69.734	.000***
Ethnicity^	---	---	---	---
Caucasian/White	1.745	.340	5.127	.000***
Chinese	1.111	.745	1.492	.136
Creole/African	.503	.130	3.868	.000***
East Indian	.267	.185	1.466	.148
Garifuna	.003	.225	.013	.990
Maya	.003	.207	.014	.989
Mennonite	.916	.634	1.444	.149
Other	1.304	.299	4.364	.000***
Civil Status^	---	---	---	---
Single	-1.101	.066	-16.773	.000***
Divorced/Separated/Widowed	-.629	.188	-3.351	.001***
Language Proficiency	---	---	---	---
Chinese	.840	.767	1.096	.273

Table 7	Multiple Regression Results for Hourly Wages & Multilingualism			
Creole	.113	.334	.338	.735
English	.798	.326	2.450	.014**
Garifuna	-.489	.464	-1.054	.292
German	.699	.721	.969	.333
Maya	-2.587	.390	-6.638	.000***
Spanish	-.027	.299	-.089	.929
Bilingual: Creole – English	-.922	.359	-2.571	.010***
Bilingual: Creole – Spanish	-.458	.557	-.822	.411
Bilingual: English – Garifuna	.017	.474	.035	.972
Bilingual: English – German	.909	.520	1.748	.080*
Bilingual: English – Maya	1.063	.398	2.671	.008***
Bilingual: Spanish – English	-.246	.334	-.738	.460
Bilingual: Spanish – Garifuna	-.368	.654	-.562	.574
Bilingual: Spanish – German	.407	.571	.714	.475
Bilingual: Spanish – Maya	1.757	.458	3.839	.000***
Trilingual: Creole – English - Spanish	1.489	.593	2.511	.012**
Trilingual: English – Garifuna – Spanish	.748	.753	.994	.320
Trilingual: English – German – Spanish	-.389	.791	-.492	.622
Trilingual: English – Maya- Spanish	-.415	.576	-.722	.471

Model Statistics: Adjusted R2 = .177; df = 45; F = 264.860, p= .000

^The reference categories include education (eighth grade), district residence (Belize), ethnicity (Hispanic= Mestizo/Spanish), and civil status (married) and were chosen on the basis of the largest categorical group. ***, **, * represent statistical significance at the .001, .05, and .10 levels, respectively. Source: Census 2000, authors' calculations.

Consistent throughout each regression estimation are our findings with gender, age, education, birthplace, residence, number of hours worked, and civil status. As the primary focus concerns language, we briefly summarize these results. Men earned just over 81 cents an hour more than women.

Each additional year of age returned about three cents an hour in higher hourly earnings. Education was by far the largest contributor to earnings with higher levels of education signaling higher levels of income. Being born in Belize added an additional 21 cents to hourly earnings. Living in urban zones increased hourly earnings by nearly eighty cents and earnings in all districts outside of Belize were reduced from $0.18 to $1.21 as compared to Belize.

The more hours one worked, the lower the hourly returns became by approximately $0.14. Additionally, married respondents earned from 60 cents to $1.10 more per hour than those who were not married. As far as ethnicity, there was a premium to being White/Caucasian. This premium ranged from $1.75 to $2.23. Others with an earnings premium associated with ethnicity included Creoles from fifty to sixty-three cents per hour. Though a bit more mixed, our findings also suggest that East Indians and Chinese benefitted from their ethnicity upwards of 45 cents and $1.32, respectively.

Language ability clearly had an impact on hourly earnings. Consistent throughout was an earnings penalty for monolinguals speaking Maya. This earnings penalty ranged from $1.18 to $2.67 an hour across all three multiple regression estimates. In concert with speaking Maya, speaking Garifuna also resulted in an earnings penalty of 77 cents per hour, though this finding (though not the sign) was only significant in our second multiple regression estimate. Knowledge of English returned an earnings premium between 57 cents and 80 cents per hour.

German language facility enhanced earnings by $1.42 an hour and speaking ability of Spanish by 45 cents an hour. When bilinguals were considered, those with the ability to speak both English and Creole found that their earnings were diminished between 58 cents and 92 cents per hour. These two languages were the only combination which penalized earnings, whereas all other significant bilingual pairs and one triad grouping were positive contributors to hourly earnings. Maya speakers who also were fluent in Spanish and English increased their earnings between $1.06 and $1.76 per hour.

Spanish speakers who learned Creole and vice-versa enhanced earnings by 88 cents per hour. German speakers who acquired English increased their hourly earnings by 93 cents. Lastly, those who were fluent in Creole, Spanish, and English were able to improve their hourly earnings by $1.49.

Required Second Language

In a national survey administered in the spring of 2006, we asked 448 Belizeans what ought to be the required second language for all Belizeans divided by language spoken at home and ethnicity (see Table 8). Over eighty percent of respondents indicated that Spanish should be the second language of Belize. Creole registered as the second language of choice for fifteen to twenty-one percent of respondents depending on the grouping (e.g., "Language Spoken at Home" and "Ethnicity").[5]

As an example of reading a row in Table 8, see the variable Creole under "Language Spoken at Home" in the top half of the table. In this row, home speakers of Creole indicated a numerical preference for Spanish (N=185), then Creole (N=45) and lastly Garifuna (N=5) as a required second language. Proportionally, these selections are 77.7% Spanish, 20.2% Creole, and 2.1% Garifuna and

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5 The remaining responses were split between Garifuna (1.6%), Maya (0.9%), Chinese (0.5%), and Hindi (0.2%) under the "Language Spoken at Home" category. By Ethnicity, the remaining languages were named by 0.7% for Garifuna, 0.2% for Maya, 0.2% for Hindi, and 0.5% for Chinese. Convincingly, Belizeans do not view these languages as second language candidates.

are similar to the overall results. When disaggregated by language currently spoken at home and ethnicity, the responses for both groups were still over eighty percent in favor of Spanish as the required second language of Belize.

Definitively, Belizeans view Spanish as the second language of the nation. Such a policy position is acknowledged in the Belize decennial census report of 2010 (SIB, 2013), though public policy has yet to catch up with national sentiment.

Table 8	Hourly Wage by First and Current Language Spoken at Home					
Variables	**Chinese**	**Creole**	**Garifuna**	**Hindi**	**Maya**	**Spanish**
Language Spoken at Home	N	N	N	N	N	N
Chinese	2	--	--	--	--	7
Creole	--	48	5	--	--	185
English	--	6	--	1	--	50
Garifuna	--	--	2	--	--	5
German	--	--	--	--	--	--
Hindi	--	1	--	--	--	1
Maya	--	--	--	--	--	4
Spanish	--	12	--	--	3	103
Total	2	67	7	1	3	355
	Chinese	**Creole**	**Garifuna**	**Hindi**	**Maya**	**Spanish**
Ethnicity	N	N	N	N	N	N
Black/African	--	2	--	--	--	11
Caucasian/White	--	1	--	--	--	10
Chinese	2	--	--	--	--	8
Creole	--	34	1	--	1	90
East Indian	--	2	--	1	--	13
Garifuna	--	8	--	--	--	27
Maya	--	--	--	--	--	16
Mestizo	--	18	2	--	--	175
Total	2	65	3	1	1	350

ANOVA F=246.757, df = 11, p= .000
Source: Census 2000, authors' calculations.

V. Discussion

While the focus of our discussion rest on the economic returns to language in the year 2000, our results also allow for the interpretation of multiple endogenous and exogenous variables. We offer our discussion in three parts: non-language related variables, language-related variables, and second language education.

Non-language Variables:

We begin with a discussion of the impact of gender, age, education, birthplace, residence, hours worked, civil status, and ethnicity. Our results show clearly that women earned less than men when controlling for multiple demographic variables such as education (where women have much higher achievement rates). While much has changed in Belize since independence, sexism persists.

As expected, age and concomitantly experience and seniority were remunerated at higher levels. Education made the biggest impact on wages in Belize. As one ascends the educational achievement ladder, so too does one's compensation. Those who possessed less than an eighth grade (standard 6) education earned about half as much as a high school graduate (4th form) with eighth grade achievement as the reference group. A Belizean with a four-year degree earned about twice as much as a high school graduate. Literally, education paid.

Birthplace also mattered. Those born in Belize earned more on average than those who were born outside the country. This certainly had to do with embedded social linkages within the country that were easier to develop and utilize for the native born. Beyond birthplace, residence contributed to differences in earnings outcomes.

Those in the city earned more than those in rural areas, which may have been primarily a function of living costs associated with urban inhabitation. Beyond rural and urban distinctions, residence by district also played an active role in earnings. Those residing in the district of Belize earned more than all other districts. On average, these earnings were about 20% higher than Cayo District and nearly double those of residents of Toledo District. There definitely existed an earnings penalty for residence outside of Belize District (or conversely a wage premium for living within the district of Belize).

The number of hours worked was also a predictor of earnings. Counter-intuitively, those who worked more hours during the week in Belize actually brought home less income on an hourly basis. In essence, the best or highest paying positions had fixed week work schedules. Those needing additional income to make ends meet were compelled to work longer hours to bring home more income. There is a difference between working harder versus working smarter. Lastly, the bulk of income earners in Belize were married.

Being married enhanced earnings versus single and separated/divorced/widowed Belizeans by $1.10 and 63 cents, respectively (married persons were the reference group for the civil status

variable). Stability, responsibility, and maturity are hallmarks of family life (Avila & Pisani, 2022) which were rewarded with higher hourly earnings.

Being Caucasian, Chinese, Creole/African, and East Indian all significantly improved earnings; the other ethnic groups showed no statistical relationship with earnings compared to the reference group of mestizos/Spanish. This improvement ranged from 45 cents an hour for East Indians to upwards of $2.23 an hour for Caucasians, with Creoles/Africans (about 50 cents) and Chinese ($1.31) falling in the middle. Each group had the ability not only to draw upon (co-)ethnic resources, but also unique circumstances. Caucasians typically derived from Canada, England, and the United States where 85% were born outside of Belize and had access to foreign resources and networks.

Many turned to the burgeoning tourist trade to earn a living in Belize or simply retired in Belize. A similar story is told with the Chinese who had a higher foreign-born rate than Caucasians and were ubiquitous in commercial affairs. East Indians were mostly native-born Belizeans (93.6%), mostly concentrated in Belize and Corozal districts, who relied on local commercial networks to enhance their earnings. Creoles/Africans had historically served as the administrative class (Bolland, 2003) and comprised the bulk of the middle class in Belize. Creoles/Africans also predominated in Belize District which had higher returns and compared to the reference group (mestizos/Spanish), earnings for Creoles/Africans performed much better.

Language-related Variables:

Without a doubt, being able to communicate in English augmented earnings in Belize. The economic returns to English language only were 64 cents an hour with some small fluctuation as bilinguals (57 cents) and trilinguals (80 cents) were considered. The language of economic power in Belize, even today, is English. Conversely, Maya speakers are penalized heavily for their indigenous roots. According to our research, Maya speakers gave up between $1.18 and $2.67 an hour merely because they spoke one of the three Maya languages (Ketchi, Mopan, or Yucatec).

Though only in Table 7 was the Garifuna language statistically significant, the signs in all three tables coincided. Speaking Garifuna, like Maya, diminished earnings. This earnings penalty was as large as 77 cents per hour and most predominately concentrated in Stann Creek District, the home to a plurality of Garifuna in our sample. Basic economics dictate the slow, but certain decline of spoken Maya and Garifuna in Belize because other languages (i.e., English and Spanish) were more highly prized from an earnings perspective.

The German language has a unique history with the Mennonite communities in Belize. For the most part, these communities are relatively affluent, networked, and entrepreneurial (Verver et al., 2020) and hence the 1,500 or so German speakers in our analysis did much better, enhancing their hourly earnings by $1.42. When German was coupled with English, the returns were still very positive at 93 cents an hour. Though speaking Spanish is sometimes derided in the media, the ability to communicate in Spanish alone increased earnings by 45 cents per hour according to our research. Spanish was spoken by more people and households than any other language in Belize. This finding suggests that Spanish was robust and valued in Belize.

There were four bilingual pairs and one trilingual triad that significantly influenced earnings. Four of the five groupings amplified earnings; only the Creole-English language proficiency pair weakened earnings. The ability to communicate in both Creole and English dampened earnings between 58 and 92 cents per hour. As English is prized singularly and in other bilingual and trilingual groupings, it was Creole which was undervalued in this bilingual combination. While Creole may be a lingua franca in Belize (along with English and Spanish), speaking Creole appears not to have enhanced hourly earnings.

As Maya is held in low economic value, combining Maya with Spanish or English significantly improved earnings from $1.06 to $1.76 an hour. Of some note, it was the combination of Maya and Spanish which generated the greatest increase in earnings. Encouraging Maya to get a good education and secondary language skills in either Spanish or English should improve their financial lot (earnings) tremendously as the Maya are the most impoverished ethnic group in Belize (IDEAS, 2006).

Evidence that Belize is a multilingual society is clearly apparent as over five percent of our sample was fully fluent in Creole, Spanish, and English. This language combination extended earnings by $1.49 an hour and facility in all three languages provided access to nearly every corner of Belize.

Ultimately, it is Creole, Spanish, and English that drive the business and government communities in Belize and those conversant in all three languages were well positioned to take advantage of commercial and governmental opportunities as they arose.

Second Language Education:

As we have already discussed, language facility in English and Spanish is widely rewarded economically in Belize according to our research. Other languages and combinations offered unique rewards (e.g., German and Chinese), but practically speaking, it was English and Spanish that enjoyed not only the greatest rewards, but also the greatest scope within the country. Adding to our discussion of the economic returns to language was the Belizean public's view of second language acquisition.

There was overwhelming public support for Spanish as the nation's second language across all language and ethnic groups. Creole did receive some support, from about 15% of the population, but more than 80% supported Spanish. We also note that English was the language of public education and hence did not factor within the second language dialogue as all educated Belizeans should have acquired English language skills.

While we do not advocate abandoning one's own family language, we do concur with the clear majority of Belizeans that Spanish, within the timeframe we have considered, offered the greatest economic opportunities not only within Belize, but also regionally (see Pisani & Pisani, 2006).

VI. Conclusion

While much has been written about Belize's multi-ethnic and multi-cultural milieu, this is the first study to empirically examine multilingualism and earnings in Belize. In this article, we have demonstrated the economic returns to language acquisition and usage in Belize in the early 20th century. Our unambiguous findings suggest that language in concert with other endogenous and exogenous variables significantly influenced the earnings outcomes of Belizeans.

Excluding language, the highest economic returns accrued to Belizeans who were older, married, male, residents of urban areas, living in the district of Belize, were native born, achieved high levels of education, and were ethnically Creole or Caucasian. When language facility is factored in, the Belizean economy primarily rewarded the ability to communicate in English and Spanish with other language skills important (e.g., German, Maya-English/Spanish, and Creole-Spanish-English).

There were, however, powerful forces that dampened earnings, including educational attainment, residence, and ethnicity. The two most important and controllable variables were higher education access and second language acquisition (either Spanish or English) for native Maya speakers.

As the nation has long endeavored to expand access to grade school education and more recently higher education, it is the expansion of second language training, particularly in Spanish (as English is part of the educational process), that should receive the attention of and continued support from policy makers at the highest levels. In order to best track the importance of language to the nation in the future, future censuses should include specifically worded questions for the ten major languages spoken in Belize.

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