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Disparities in Health and Access to Health Care among Official-Language Minorities in Québec

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Abstract

This study estimates the effect of French language ability on self-reported health and unmet healthcare needs in Québec using a multiple logistic regression design. We find that unilingual Québec Anglophones are 26% more likely than bilinguals to report poor health. Worse health is expected to compel greater use of health care based on theory and evidence from multiple comparative contexts. However, despite their poor health status, unilingual Anglophones are 52% more likely to report unmet health care needs. These disparities in health status and health care access are explained by differences in French language ability, robust to demographic and socioeconomic controls. The findings suggest that policies to reduce barriers to health care access among unilingual Québec Anglophones can have substantial health benefits.

Keywords: Québec Anglophones; Health service utilization; Health disparity; Healthcare access; Linguistic minority health

Introduction

Does language affect one's health and ability to obtain health services in Québec? The role of French language ability has a special relevance in Québec, where Anglophones are an official-language minority. Minority-status attributes are widely acknowledged in the public health literature as affecting the health of minority populations and erecting barriers to their access to health services. However, the minority attributes typically examined are often limited to a familiar set that includes age, income, education, socio-economic position, along with some race, ethnicity, religious, cultural, or immigration status attribute as a potential source of discrimination (LaVeist, 2005; Williams & Collins, 2001). There is a need for an investigation of language differences as a determinant of health disparities between groups with otherwise similar characteristics.

The *Canadian Journal of Public Health* devoted a recent special issue to the problem of health access among linguistic minorities (S1, 2013). In their editorial, Leis & Bouchard (2013) identify a scarcity of evidence-based data in the field of research on the vulnerabilities of official-language minority populations. In seeking to rectify this scarcity, the special volume contains studies testing linguistic minority status as a determinant of mental health (Puchala et al., 2013), depression among arthritics (Fotsing et al., 2013), overweight/obesity (Gagnon-Arpin et al., 2013), physical inactivity (Imbeault et al., 2013), and nutrition (Batal et al., 2013; Villalon et al., 2013), and several other types of health outcomes, with varying results. The findings on minority-language effects reported in these studies are often limited to small subsets of the analytic samples, apply only in limited circumstances, or are mostly explained away by associated covariates, reducing the explanatory power of language as a health determinant.

In their 2011 edited volume, *Minorités de langue officielle du Canada: Égales devant la santé?*, and later in their 2013 article *Linguistic Minorities in Canada and Health*, Bouchard & Desmeules consolidate and advance the theoretical and empirical discussion of the health effects of linguistic minority status in Canada based on a path-breaking program of research by Bouchard and colleagues (see also Bouchard et al., 2009). They use several provincial and federal data sources to demonstrate that despite both official languages being equal before the law, language remains a social determinant of health for linguistic-minority populations; both Anglophones within Québec, and Francophones in English Canada. Like the present study, Bouchard & Desmeules (2011) report linguistic barriers to access to health care as a potential determinant of health status, and provide a number of recommendations for reducing the negative health effect of linguistic-minority status.

The status of Québec Anglophones as a language minority is unique in North America, speaking the dominant language of the continent, yet being the linguistic minority in a province where the healthcare system is administered in French. As such, Québec Anglophones represent a population sample well-suited to the investigation of a language effect holding many other social, demographic, and cultural factors constant. This study examines the role of language ability as a determinant of the health status of Anglophone Québecers and of barriers to their access to health services.

The majority of Québeckers are unilingual Francophones (51.8%), but a large minority are bilingual in both English and French (42.6%), and are concentrated in Montréal. A small proportion of Québeckers are unilingual Anglophones (4.6% – also concentrated in Montréal), and a yet smaller proportion (1.0%) speaks neither English nor French (2011 Census). In 2005, The Community Health and Social Services Network (CHSSN) commissioned the 'Community Vitality Survey' to understand issues of health and access to health services among the Québec Anglophone population. This article presents an analysis of the findings from that survey to demonstrate and explain inequitable health outcomes and access to health services among Québec Anglophones. Understanding the factors which determine a worse health status and unrealized need for access to health services is particularly relevant for public policy in a setting in which universal health care has as a principal policy objective the elimination of inequitable health disparities[1] (Canada Health Act, 1984, c.6 s.3).

This study is motivated by our observation that several features of the unilingual Québec Anglophone population points toward an increased need for health services. Québec Anglophones who report being unable to speak, read, or write French are generally older, have lower incomes, and have lower educational attainment – all of which are social correlates that echo the profiles of their Francophone minority counterparts in English Canada (Silva et al., 2014). Each of these socio-demographic features is already well established as detrimental to health (Adler & Newman, 2002; House et al., 1994). These health detriments are expected to compel greater use of health services, particularly in a system of universal health care. Any disparity between a poor health status in such a context, and unrealized use of health services when higher use is expected, is conceptualized as "unmet need" or "foregone care"

The research question that drives this study is whether, and to what extent, differences in language ability can explain the disparity in self-reported health between unilingual and bilingual Anglophones in Québec. French language ability is significantly associated with health status, and the effect remains robust controlling for demographic and socio-economic factors. A further question is whether a worse health status compels a proportional increase in use of health services. Our hypothesis is that, in the context of a universal healthcare system which is free at the point of service, unilingual Anglophones' higher age, lower income, lower educational attainment, and worse self-rated health would each suffice to compel increased use of health services. Moreover, because these attributes all exist together in this sub-population, we strongly expect to observe higher than average use of health services. Our findings indicate that despite all these impulses toward greater use of the healthcare system, unilingual Anglophones use fewer health services than their bilingual counterparts, in both frequency and type.

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[1] "[T]he primary objective of Canadian health care policy is to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers." *Canada Health Act 1984, c. 6, s. 3.*

Background

Canada has a comprehensive universal health care system which is free for users at the point of service. All medically necessary hospital and physician services are paid by Canada's system(s) of public health insurance, often referred to as "Medicare". However, Canadian Medicare is not a single-payer national health service. Rather, it is an interlocked system of provincial health services, the terms of which are set out in the federal legislation *Canada Health Act* (1984). The Canada Health Act stipulates that provinces in compliance with the Act will be fully reimbursed through cash transfers for all eligible medical expenses incurred by their residents. Residing in a province is the only basic requirement for a citizen's Medicare coverage (*CHA*, 1984). While the terms of the Act remain universal across Canada, differences in the style and degree of provincial compliance with the Act nevertheless allows for diversity in health service delivery across provinces.

Québec is not an officially bilingual province. "The Government of Québec, in order to foster the application of the Charter of the French Language, which makes French the official language of Québec ... has established a policy aimed at promoting the use of French" (Gouv. du Québec, 2009). The Charter establishes French as the exclusive language of government, public administration, law, and public and semi-public services, including health service delivery (Gouv. du Québec, 2013a). The Charter provides for official communications in both French and English only under special circumstances, such as where public health and safety are concerned, but this does not include the day-to-day operations of hospitals and clinics nor their routine health service delivery. Rather, it is the *Act Respecting Health Services and Social Services* under the purview of the *Ministère de la Santé et des Services Sociaux* which entitles Québec English-speakers to receive health services in English, but the fulfillment of this entitlement is contingent upon the health service provider's organizational structure, and its human, material, and financial resources (Gouv. du Québec, 2013b). For example, a health service provider can fail to provide services in English without violating the *Act* if they lack English-speaking staff (human resources), if they lack information or documents in English (material resources), or if they simply cannot afford to comply with the English-language provisions of the *Act* (financial resources). With these important points of potential service-delivery failure, some health providers do fail to provide services in English. Shortcomings in the availability of English-speaking health professionals, information, and documents were specifically referenced as problematic during the authors' qualitative investigation into Anglophone interactions with Québec health services for this study. Despite the constitutionally-protected equal legal status between French and English in Canada, these shortcomings have led Bouchard & Desmeules (2011) to ask whether this legal equality has been maintained in the health sector.

The language barrier goes beyond a convenience issue. In one serious instance described in an interview for this study, a hospital's failure or refusal to provide an informed consent document in English resulted in medically-significant harm to a patient due to withheld postpartum treatment after giving birth: there was no consent document for treatment available in English, and the patient was not permitted to sign a French document because

consent was not considered properly "informed" to a standard of medical ethics – despite the patient's verbal request for treatment, and despite her bilingual spouse's verbal translation of the document. As a result of withheld treatment, the patient suffered both physically and psychologically: her postnatal healing, severe post-partum depression, and traumatic emotional detachment from her newborn took months to overcome. We consider the language gap in health service delivery, like the one in this example, as a likely mechanism by which a health system user's poor French language ability can negatively affect their future propensity to seek health services, and by extension, as a mechanism by which language ability affects health itself, through an egregious "unmet need" producing future "foregone care."

Analytic Strategy

In seeking to investigate the individual and social determinants of health service use, no conceptual model has had the research and policy impact of the Andersen (1995) model of health care access and utilization, sometimes called the "Behavioural model of health services use" (Ricketts & Goldsmith, 2005). The model, visualized in Figure 1, comprises four components, 1) Environment, 2) Population characteristics, 3) Health Behaviour, and 4) Outcomes, each linked by arrows indicating the direction of the causal mechanisms. Of particular interest to this study are the elements that remain constant across our comparative population groups of unilingual and bilingual Anglophones, and those that vary, making this study design possible. Many of the elements from the Andersen model are operationalized as variables in the CHSSN survey, making it a suitable framework for the analysis and interpretation of this data.

Figure 1: The Andersen (1995) Model of Health Services Use
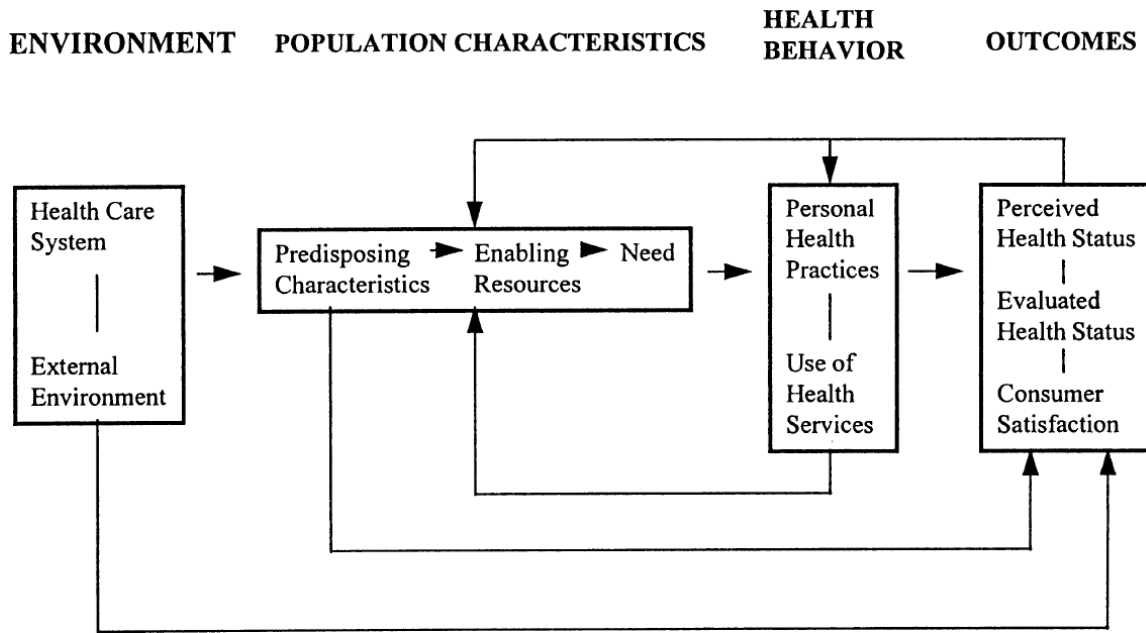
Source: Andersen, 1995. Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? Journal of Health and Social Behavior, 36(1).

The first component, _Environment_, comprises the two elements _Health Care System_ and _External Environment_. These remain constant across both analytic groups because of the universality of the health care system in Canada and the shared geographic, social, political, and cultural environment of Québec. It should be emphasized that this consistency in the health care environment across groups refers specifically to the regime of equality in health services provision, notwithstanding the potential criticism of this assumption based on our later discussion that perhaps, due to the disparities we find, unilingual and bilingual Anglophones (not to mention Francophones) do not really experience the "same" health care system in Québec, nor inhabit the same social and cultural environment.

From this starting point of a shared environment, it is the second component _Population Characteristics_ where we begin to compare the determinants of health between unilingual and bilingual Anglophones that cause the differential outcomes in health status and access to health services that we observe. Here, the elements _Predisposing Characteristics_ are mediated by _Enabling Resources_ to produce _Need_. Linguistic minorities embody some of these disadvantageous characteristics that contribute to an increased need for health services. For example, they are older, less educated, and earn less income (Silva et al., 2014). This increased need results directly from how these determinants operate negatively on health, represented in the conceptual model by the arrow linking these determinants to _Health Status_, in the fourth component _Outcomes_. Andersen conceptualizes _Enabling Resources_ at a community or population level, but in the context of our study, a human-capital element, such as speaking the language of health service delivery, is an individual-level enabling resource not to be overlooked. The combination of predisposing characteristics and enabling resources determines the real or perceived level of _Need_.

The third component _Health Behaviour_ contains the second of our two outcomes of interest, _Use of Health Services_, along with _Personal Health Practices_. Personal health habits such as health-promoting and health-damaging behaviours are not measured in our survey data except to the extent that it captures the use of health services. At best, we can assume that unmeasured personal health behaviours (such as smoking, exercise, etc.) are distributed randomly across our two comparison groups, and at worst, these may represent a source of unobserved heterogeneity confounding our estimated effects of French language ability. Nevertheless, we expect that any such confounding, if it exists, to exacerbate the observed health differences between unilingual and bilingual Anglophones, thus negatively biasing our associations of interest. Therefore, in the absence of controls for health behaviours, but using known socioeconomic correlates, we consider our results conservatively biased, if at all.

The fourth and final component of the Andersen Model is _Outcomes_, where our first outcome variable of interest, _Perceived Health Status_ resides along with _Evaluated Health Status_. This component also includes _Consumer Satisfaction_, which is relevant to our later discussion of Unmet Need and Foregone Care. Of particular interest is the causal direction of feedback from consumer satisfaction, after a user's journey through a health service experience, which feeds back into the factors that initially compel use of health services. This provides a conceptual mechanism by which we can understand how unmet need can

reduce one's future propensity to seek care (i.e., "foregone care") even while health declines. It is against the backdrop of this conceptual model that we construct our analytical strategy. We observe that the contextual factors shared by unilingual and bilingual Anglophones are constant, allowing us to isolate the variance in language ability as a potential cause of the disparity in health status and health service use between the two groups.

Data & Methods

Our approach to addressing the research question is to analyze the Québec Community Health and Social Services Network (CHSSN) 2005 "Community Vitality Survey". This survey data contains information from 3129 respondents across a range of 200 questions. The survey was targeted to the Québec Anglophone population, and is thus considered a purposive stratified oversample of this population relative to its proportion of the Québec population. The survey contains many relevant demographic data such as the respondent's age, gender, income, educational attainment, and region of residence. The survey measures language differences using several question types, which can be loosely grouped into three themes. On the first theme of *Language Identity*, the survey reports the respondent's mother tongue, and their declared "linguistic identity" which can include Anglophone or Francophone. Despite the survey being targeted only at Anglophones, 2% of respondents identified as "Francophone", and 25% identified as "Both Anglophone and Francophone" (with 70% "Anglophone only" and 2% "Neither"). The second theme measuring language differences is *Language Use* on a daily basis. The survey reports the language of daily activity such as at work or school, the language used most often at home, and the language spoken most often with a spouse/partner or children. Finally, on the third theme of *Language Ability*, the survey reports whether the respondent can speak, read, or write French (each asked separately).

The survey reports useful health-related responses that comprise our outcome variables of interest. To measure health status, the survey reports respondents' self-rated health on a 5-point scale from "bad, average, and good" to "very good, and excellent". While subjective self-rated health is sufficient to justify our hypothesis of increased health services use associated with poor health (e.g., by increasing perceived *Need* as per the Andersen model of health service use), it is also established as a reliable proxy for objective measures of health (Miilunpalo et al, 1997; Burstrom, 2001). Both subjective and objective measures of health status are included in the Andersen model of health access as *Percieved* and *Evaluated Health Status*.

To measure access to health services, the survey reports whether respondents have accessed any of the following five health services in the past year for themselves or for someone else: 1) a doctor at a private office or clinic, 2) a CLSC (Québec's system of community health agencies), 3) a call to the InfoHealth / InfoSanté health phone line, 4) an Emergency room at a hospital or the use of a hospital outpatient service, and 5) an overnight hospitalization. From these substantively rich measures of access to health services, we

have the components of an analytical model to investigate the disparity in health outcomes and health service use between unilingual and bilingual Anglophones.

We made transformations to some of our variables for conceptual and methodological reasons. We recoded the ordinal self-rated health variable into a dichotomous variable measuring poor health versus good health, using a cleavage as close to the median value as possible while preserving substantive difference. According to our recoded measure, 37% of respondents in our sample indicated "poor" (below-average) health.

We constructed a binary variable to measure use of any health service in the past year. Unfortunately, the data does not capture the frequency of multiple health service use, so when a respondent indicates "yes" to the question asking whether they had used the services of a doctor in the past year, we cannot distinguish whether this means once or ten times. Therefore, the conceptually-coherent way to recode the data is to distinguish between respondents who have used *any* health service in the past year, versus those who used none. 26% of respondents indicated zero use of any health service in the past year. A further conceptual problem is distinguishing among types of respondents who reported zero access to any health services in the past year. Did they have no need to access health services because they were extremely healthy – or because they were sick but lacked access? The descriptive data shows that among respondents who reported zero health service use, 30.0% report poor health, which is less than the 37% proportion of poor health in the overall sample. This suggests two things. First, it suggests that one potential reason for accessing zero health services in the past year is good health, because the sub-sample who did not access health services was healthier than average. Second, it confirms that the trend found nationally and internationally is also found in our sample: that poor health compels greater access to health services, at least in the context of universal health care.

To overcome the problem in our variable measuring access to health services, and to better allow it to express a barrier to access among those in need, rather than a lack of need due to good health, we constructed an interaction measure for respondents who indicated zero access to health services, and who *also* reported poor health. This "unmet need" interaction measure ensures that we are not erroneously conflating associations between respondents inappropriately clustered together who have no need for access to services because of their good health, with those who have need because of poor health but no access. The "unmet need" variable should be understood to include both its implied supply-side failure to deliver health services, plus its demand-side failure to seek needed health services ("foregone care"). 20.9% of respondents who indicate "poor health" also indicated zero health service use in the past year, and these 242 respondents represent 7.7% of the total survey sample: the subsample who are unhealthy but lack access to health services.

Our primary independent variable is French language ability. Of the three broad themes of language variables described above, French *Language Ability* showed more internal validity and consistent association with our outcome measures than either *Language Identity* or daily *Language Use*. Language ability measured whether the respondent could speak, read, or write French, each asked separately using yes/no questions. Adding up the

sum of these responses permitted the construction of a French ability *index* ranging from 0 (no French ability) to 3 (respondent can speak, read, and write French). An analysis of the index scores showed these to be reliable gradients of increasing French ability, with few respondents indicating that they could read or write French without also first speaking it. 29.6% of respondents indicated no French ability, while 18.2% could speak, but not read or write French. 24.4% could both speak and read, but not write French, and 27.9% reported full ability to speak, read, and write French. We report results based on both a *binary* French language ability measuring either "no French" versus "any French ability", as well as an *index* of French ability from 0 to 3.

The use of *French ability* as our primary independent language variable is a departure from that used in the path-breaking research program undertaken by Bouchard and colleagues in their examination of linguistic minority status as a health determinant (such as Bouchard & Desmeules 2011, 2013; Bouchard et al. 2009). The *Canadian Community Health Survey* used in this group of studies measures linguistic identity or identification with a linguistic community, such as Anglophone or Francophone. Bouchard and Desmeules (2013) construct an algorithm to determine linguistic minority status which includes these components, plus the respondent's preferred language, the language in which the survey was conducted, and official language first learned and still understood, to best distinguish "Anglophones" from "Francophones". However, measures such as linguistic identity, linguistic-minority status, and mother tongue are not always a reliable proxy for the ability of an individual to navigate the health care system, or social life in general, in a minority-language environment. Given that a large proportion of official-language minorities in Canada are bilingual, sometimes fluently so, it seems that instrumental language skills, and not language identity or other cultural identifier, are the determining factor in whether one's linguistic minority status operates as a determinant of health. The existence of a language ability variable (speaking, reading, writing) in the CHSSN data permits us to use a new operationalization of a language determinant that is conceptually closer to the mechanism by which language is proposed to operate on health and access to health care.

Our control variables include age (in years), sex, income (measured in ten increments from "less than $20,000" to "$150,000 or over"), and education (measured in ten increments from "did not complete Elementary School" to "completed post-graduate"). The ten income categories were collapsed into five, to produce a more normal income distribution and more consistent ranges between income categories. The ten education categories were recoded into three, corresponding to the attainment of educational credential benchmarks that we expect are most strongly associated with socioeconomic position (Montez & Hayward, 2014). As such, the education benchmarks are 1) "Less than high school diploma", 2) "Completed high school diploma", and 3) "Completed post-secondary degree or diploma".

Analysis

We employ a two-step multivariate logistic regression design. In the first step, we use logistic regression to analyze the association between our poor-health outcome and French

language ability, along with relevant control variables. After we demonstrate robust differences in health outcomes between the unilingual and bilingual Anglophones in our sample, we use a second step logistic regression to analyze the association between unmet need and French language ability, again with control variables. All statistical procedures use STATA version 12.0.

Our first hypothesis is that the disadvantageous socioeconomic characteristics of the unilingual Anglophone population will compel greater use of the health care system. The descriptive statistics in Table 1 show that unilingual Anglophones are older, earn less income, and have lower educational attainment, echoing the findings by Silva et al. (2014). Our hypothesis is consistent with findings from studies on the factors influencing health care use elsewhere in Canada and in other developed countries with universal health care. For example, Roos & Mustard (1997) report in their study of health service use in Winnipeg, Manitoba that poor health is associated with increased use of hospital and physician services. They cite similar findings from the United States and Finland. Van Doorslaer et al. (2006) report that in 21 OECD countries, sicker respondents in the bottom income quintiles use 50% more health services than those in the top quintiles. Wiggers et al. (1995) report that in Canada and Australia, socioeconomic disadvantage compels more use of health care, but in the case of Italy and Netherlands, that disadvantage might act as a barrier to certain specialist services. Both in Canada and internationally, a lower socioeconomic position, defined by lower income and educational attainment, is associated with more frequent use of routine health services. This provides the basis for our hypothesis that worse health should compel greater use of health care, and in our analytic sample, we find that this is the case (see *Table 1*). The consistency between the associations observed in our data and the associations anticipated by theory and observed in other research contexts establishes the internal and external validity of our sample, against which any differential health outcomes among analytic subgroups can be compared.

Results

Table 1 shows the descriptive statistics of our sample population. The data shows that unilingual Anglophones have a higher mean age, lower mean ordinal income, and lower mean ordinal educational attainment. They also have lower mean self-rated health and a higher percent reporting "poor health". It is curious, then, that unilingual Anglophones report lower-than-average access to health care in the past year. This is the disparity which motivates the study. Lest the reader believe that unilingual Anglophones forego access to health services because they are disproportionately healthy, we report the descriptive data for "unmet need", which shows that 10.5% of unilingual Anglophones report poor health *and* zero access to health services – much higher than the 7.7% average for the combined sample, or the 6.7% average for bilingual Anglophones.

Table 1: Descriptive Statistics of the Analytic Sample

Variable	Total (N)	Mean or %	Standard Deviation	Minimum	Maximum
Self-Rated Health	2499	3.71	1.07		
Bilingual	1762	3.80	1.03	1	5
Unilingual	468	3.56	1.14		
% Reporting Poor Health*	2499	36.2			
Bilingual	1762	32.6			
Unilingual	468	43.2			
% Reporting Access to Healthcare Past Year	2499	74.5			
Bilingual	1762	75.5			
Unilingual	468	72.0			
Unmet Healthcare need*	193	7.7			
Bilingual	118	6.7			
Unilingual	49	10.5			
% Reporting No French Ability	2239	21.0			
French Ability Index*					
% No French	737	29.5			
% Speak	448	17.9			
% Read	624	25.0			
% Write	690	27.6			
Age (Years)	2499	49.77	15.29	18	97
Bilingual	1762	48.08	15.12	18	97
Unilingual	468	53.30	15.46	18	89
Sex (% Male)	2499	44.5			
Bilingual	1762	44.3			
Unilingual	468	43.8			
Income (10 ordinal categories)	2499	4.92	2.78		
Bilingual	1762	5.28	2.74	1	10
Unilingual	468	3.95	2.62		
Education (10 ordinal categories)	2499	5.99	2.25		
Bilingual	1762	6.44	2.10	1	10
Unilingual	468	4.98	2.27		

* Indicates author-recoded variable

Table 2 reports the first step in our two-step regression design. The coefficients in Table 2 are odds-ratios for the likelihood of indicating "poor health" based on our two measures of language ability (binary "no/yes" and index "0-3"), controlling for age, sex, income, and education. Odds-ratios higher than 1.00 indicate an increased likelihood of reporting poor health, while odds-ratios lower than 1.00 indicate a decreased likelihood (i.e., better health). The table is divided into three sets of columns. The first two columns 1a and 1b indicate the bivariate association between reporting poor health and French language ability. Column 1a reports the bivariate association with the *binary* French ability variable measured as "no French" versus "any French ability." Column 1b reports the bivariate association with the *index* of French ability measured from 0 to 3. It is notable that, without yet controlling for any covariates, both measures of French ability are significantly associated with reporting poor health. In the first row of column 1, we see that respondents reporting "No French" have an odds-ratio of 1.558 (or 55.8% higher likelihood of reporting poor health) compared to respondents who could speak, read or write French. Looking at column 1b, we see the odds-ratios of reporting poor health decreasing with improved French ability. The better the respondents' French, the better their self-reported health, with those reporting a French ability index score of 3 (who can speak, read, and write French) having only about half the likelihood (50.9%) of reporting poor health compared to respondents with a score of zero (no French ability). Both associations are significant to at least the $P \leq 0.05$ level, and in all but one case to the $P \leq 0.001$ level.

Table 2: Logistic Regression Odds Ratios with Robust Standard Errors for the Determinants of Poor Health Status among Anglophone Official-Language Minorities in Québec, 2005.

DV: Poor Health	Model 1a: Bivariate (Binary IV)	Model 1b: Bivariate (Index IV)	Model 2: Controls[1]	Model 3a: Full model (Binary IV)	Model 3b: Full Model (Index IV)
No French Ability	1.558*** (.165)			1.256* (.142)	
Index of French Ability[2]: 1 (Bilingual)		.785* (.096)			.880 (.110)
Index of French Ability[2]: 2 (+ Reads)		.595*** (.067)			.729** (.087)
Index of French Ability[2]: 3 (+ Writes)		.509*** (.057)			.652*** (.078)
Age (Years)			1.003 (.003)	1.001 (.142)	1.001 (.003)
Sex (Male)			.950 (.082)	.908 (.083)	.938 (.081)
Income (5 categories)			.783*** (.027)	.797*** (.029)	.792*** (.028)
Education (3 categories)			.816** (.052)	.854* (.061)	.867* (.057)
Constant	.482*** (.022)	.799** (.059)	1.541 (.352)	1.327 (.335)	1.775* (.414)
Observations	2239	2499	2499	2239	2499
Pseudo-R^2	.006	.013	.031	.029	.036

*$P \leq .05$; **$P \leq .01$; ***$P \leq .001$

[1]Controls regressed using larger analytical sample from model 3b (Index DV), no significant change in control estimates based on analytical sample selection.

[2]With reference to excluded category "0", no French ability.

The third column "Model 2" introduces the effect our set of control variables on poor health, with a combined pseudo-R^2 value of .031. This control-only model uses the larger analytical sub-sample of 2499 observations as used models 1b and 3b (which use the *index* of French ability), but the estimates are not significantly modified whichever analytic sub-sample we use. The control variables show that income and education are significantly associated with health status, with higher income and better education associated with better health, as we expect based on the findings from elsewhere in Canada and other developed countries, and based on widespread understandings of the social determinants of health. Here, gender is not significantly associated with an increased likelihood of reporting poor health. The reader might also be surprised to see our regression result that age is not significantly related to health outcomes. This is because the survey self-rated health question had a built-in age-control mechanism, by asking "How would you rate your health, *compared to others your age*?" As such, the health variable is already age-controlled and is appropriately devoid of any association to age in the logistic regression model. Nevertheless, both age and gender are justifiably included in our final regression models as conceptually relevant control variables.

The fourth column reports the full model 3a, which is the association between poor health and *binary* French ability, plus controlling for the set of covariates. Reporting "no French ability" is associated with a relative risk of 1.256, or a 25.6% higher likelihood of reporting poor health relative to respondents who reported "any French ability", significant to the p ≤ .05 level. Including the set of covariates explained away some of the effect reported in model 1a, but a significant portion of the disparity in reporting "poor health" remains explained by French ability.

The fifth and final column in Table 2 reports the full model 3b, which is the association between poor health and our *index* of French ability. The index shows a steadily decreasing relative risk of poor health as French ability increases from 0 to 3. Only the French ability score of 1 fails to achieve statistical significance, with scores of 2 and 3 achieving significance to a P ≤ 0.01 and 0.001 level, respectively. Relative to respondents who score zero for "no French" ability, speaking, reading, and writing French is associated with a 12.0%, 27.1%, and 34.8% reduction in the likelihood of reporting poor health, controlling for age, sex, education, and income.

The general conclusion from Table 2 is that whether French ability is measured as a binary variable for "no French" versus "*any* French" ability, or measured as an index of increasing French ability from 0 to 3, our data shows a clearly higher relative risk of reporting poor health for those with little or no French ability which is not explained by the socio-demographic covariates.

We now turn to the second-step logistic regression model, in which we apply our finding of worse health among unilingual Anglophones to an analysis of access to health care services. As we discussed, several features of the unilingual Anglophone population in our dataset compel a hypothesis that they will make greater use of health care. It was demonstrated earlier that unilingual Anglophones are generally older, earn less income, and

are less educated than their bilingual counterparts, with each of these features sufficient to predict greater use of health care. Then in the first step regression reported in Table 2 we also demonstrated that they are significantly more likely to report poor health, which we also predicted to compel greater heath care use. We now construct a logistic regression model to test the determinants of healthcare use by language ability, controlling for poor self-reported health and the same set of covariates.

Table 3: Logistic Regression Odds Ratios with Robust Standard Errors for the Determinants of Health Care Access among Anglophone Official-Language Minorities in Québec, 2005

DV: Accessed any health service in the past year	Model 1: Bivariate	Model 2: Controls	Model 3: Full
No French Ability	.842 (.098)		.744* (.092)
Poor Health (1 = "Poor Health")		1.343** (.144)	1.361** (.146)
Age (Years)		1.017*** (.003)	1.018*** (.003)
Sex (Male)		.759** (.076)	.760** (.076)
Income (5 categories)		1.031 (.040)	1.022 (.040)
Education (3 categories)		1.023 (.080)	.987 .078
Constant	3.083*** (.171)	1.165 (.311)	1.330 (.361)
Observations	2239	2239	2239
Pseudo-R^2	.001	.017	.019

*$P \leq .05$; **$P \leq .01$; ***$P \leq .001$

Table 3 reports the odds-ratios for the relative likelihood of reporting *any* interaction with the health care system in the past year, based on French ability, self-reported poor health, and the set of control variables. The first column shows the bivariate association between French ability and access to health services. The estimate shows a reduced likelihood of accessing any health service in the past year for those with no French ability, but the estimate does not achieve statistical significance.

The second column reports the associations between access to health services and the set of control covariates. In the first row of control variables we see, as expected, that "poor health" is significantly associated with increased use of health services, with a relative likelihood of health service use 34.3% higher than those reporting good health. Whereas age was shown to be uncorrelated to health status in Table 2 because of the survey question's built-in age control, in Table 3 we now see that each additional year of age is associated with a 1.7% increase in the likelihood of accessing health services, statistically significant to $P \leq .001$ level. Whereas in Table 2 both genders reported relatively equal likelihood of poor health, in Table 3 we now observe that males are 24.1% less likely to access health services. Whereas the income and education control variables were significant social determinants of health status in Table 2, they are not significant determinants of access to health services in Table 3.

The third column in Table 3 reports the full logistic regression model showing that a lack of French ability is associated with a 25.6% reduction in the likelihood of seeking health services, significant to a $P \leq .05$ level. Importantly, this result controls for age, gender, income, education, *and* poor health status. Stated in terms of our population health concern, this result shows that among Anglophones with a pressing need for health services, and who are equal in their demographic and personal characteristics, those who can't speak French are 25.6% less likely to obtain health services. This disparity is conceptualized as unmet need and foregone care. Next, we take one further step in the examination of the phenomenon of unmet healthcare need.

A final regression Table 4 shows the effect of French language ability, again with our same set of control covariates, this time on an interaction variable describing "Unmet Need", which is a binary variable we constructed measuring respondents who indicated "poor health" *and* zero use of any health service in the past year. These are the respondents who have reported a pressing need for health services by their poor health status, but who did not receive it or did not seek it.

Table 4: Logistic Regression Odds Ratios with Robust Standard Errors for the Determinants of Unmet Need in Health Care Access among Anglophone Official-Language Minorities in Québec, 2005

DV: Unmet Health Care Need	Model 1: Bivariate	Model 2: Controls	Model 3: Full
No French Ability	1.624** (.290)		1.523* (.286)
Age (Years)		.979*** (.005)	.978*** (.005)
Sex (Male)		1.238 .205	1.240 (.206)
Income (5 categories)		.751*** (.051)	.763*** (.052)
Education (3 categories)		.903 (.111)	.954 (.118)
Constant	.072*** (.007)	.533 (.216)	.427* (.178)
Observations	2239	2239	2239
Pseudo-R^2	.006	.030	.034

*$P \leq .05$; ** $P \leq .01$; *** $P \leq .001$

Table 4 reports an additional perspective on the inequity in health care access, by showing the association between French ability and "unmet need". The odds-ratio in the full regression model reports that Anglophones who can't speak French are fully 52.3% more likely to report unmet healthcare needs, defined as poor health with zero access to health services, significant to the P ≤ 0.05 level, and controlling for socio-demographic covariates.

Discussion

Our findings confirm a disparity in health outcomes by showing that unilingual Anglophones, who exhibit disadvantageous socio-demographic characteristics, are also more likely to report poor self-rated health. Our hypothesis is that this worse health status among older, poorer, less educated, and sicker unilingual Anglophones will compel greater use of health services in a universal healthcare system whose stated purpose is the elimination of inequitable health disparities, and which is free for users at the point of service. We test this hypothesis and find that, despite their worse health and disadvantageous socio-economic measures, unilingual Anglophones report less use of health services. We conceptualize this unrealized use of health care services, when need is higher and increased use is expected, as "unmet need" or "foregone care."

Unmet need implies a supply-side barrier to the provision of needed health services to a vulnerable population. This can occur when, for example, health facilities are located in such a way as to disadvantage isolated populations or, with relevance to this study, when health services are not or cannot be provided in the patient's only language spoken or understood. Foregone care, on the other hand, implies a demand-side failure to seek needed health services for oneself, for any number of reasons. A potential patient might forego care based on real or perceived barriers to accessing services, which can include language difficulty or a prior experience with language discrimination (Andersen, 1995).

Income and education prove to be significant determinants of health among Québec Anglophones, which conforms to other Canadian and International data. However, an examination of the differences between the effect of these socioeconomic control variables on health status in Table 2, and on access to health services in Table 3, reveals some good news about the policy goals of the Canadian health care system. Recall from Table 2 that income and education were significantly associated with health status – this is familiar in medical sociology and social epidemiology. The good news from a health policy perspective is that these factors, despite being strong determinants of health, are not associated with access to the health care system in Table 3[2]. This provides some evidence that the policy goal of "facilitat[ing] reasonable access to health services without financial or other barriers" is meeting with some success (CHA, 1984, c.6, s.3). Instead, "need" in terms of poor health is a more important determinant of obtaining health services. Nevertheless, we have shown that even among the needy, health services are not obtained equally between Québeckers of different official-language ability. Québeckers who cannot

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[2] Neither income nor education is remotely close to a statistically significant association, with p-values of .438 and .776 respectively.

speak French exhibit a greater health care need, in terms of worse health, than their bilingual counterparts. However, this increased need does not translate to increased health service use. Instead, unilingual Anglophones experience a significant gap between their need for health care and its fulfilment compared to bilinguals. This echoes the findings from Bouchard's analysis of Francophone linguistic minority counterparts in English Canada (2009; 2011; 2013). When we construct an interaction measuring unmet need, we see that unilingual Anglophones are much more likely to simultaneously be in poor health and fail to obtain needed health services. This same counterintuitive relationship between poor health status which fails to compel greater use of health services among linguistic minorities was also found by Batista and colleagues (2014) among Francophone immigrants from foreign countries in English Canada.

We argue that this disparity between unilingual and bilingual Anglophones is not due to environmental factors, predisposing characteristics, or variations in the availability of health services. Each of these factors remains constant across both language groups or is controlled in our statistical models. Rather, if we interpret these findings against the backdrop of the Andersen Model of access to health services, we find evidence that negative outcomes from interactions with the healthcare system may negatively influence the propensity to seek health services for subsequent needs. This is conceptualized by the causal mechanism in the Andersen Model by which _Outcomes_ in terms of "consumer satisfaction" affect the _Health Behaviour_ of seeking subsequent health services. Leis & Bouchard state that "linguistic barriers have a damaging effect on access to health services" with negative effects for both quality and satisfaction of care (Leis & Bouchard, 2013). Negative health outcomes are expected to increase the need for health services, so "consumer satisfaction" is a plausible causal mechanism in the Andersen model by which a negative experience with health services can decrease subsequent use, even while health declines. This characterizes an "unmet need" on the part of a health institution in terms of a failure, perhaps of the type described earlier, to provide services and resources in English, producing subsequent "foregone care" on the part of the health system user. This explanation is supported by interview data collected by the authors, but should be tested systematically in future interview research.

A limitation of this study is the impossibility of disentangling "unmet need" from "foregone care" in the disparity in health service use that we identify. The data cannot distinguish which is occurring, merely that a barrier exists. A qualitative investigation into the reasons for the inequitable gap in health service use among unilingual Québec Anglophones would be a welcome compliment to this study. An improvement in bilingualism among either patients or health providers will work to improve this disparity, and there are community groups working to bridge the language gap from both sides. However, in terms of the policy implications of this study, only the supply-side (health institutions) have a legal and constitutional mandate to accommodate linguistic-minority patients. An interesting complement to this study would be to examine the health outcomes of linguistic-minority patients based not on their own personal characteristics, but on the language accommodations offered by the clinics and hospitals they use.

Conclusion

We have demonstrated that an inequity exists in access to health care services among unilingual Anglophones. Although this subset of the Québec population generally has a lower income, less education, a higher age, and worse self-rated health than their bilingual counterparts, their reduced language ability is associated with unmet healthcare need after controlling for these demographic and socioeconomic factors.

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