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Language And Health In The Hispanic/latino Population

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Language and Health in the Hispanic/Latino Population

A Thesis Submitted to the
Yale University School of Medicine
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Medicine

by
Gladys Magaly Rodriguez
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Abstract

LANGUAGE AND HEALTH AMONG HISPANIC/LATINO POPULATION.

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Hispanic/Latinos are the fastest growing racial/ethnic minority in the US and are often treated as a monolithic group in health disparities research. Language ability and preference, two distinct linguistic constructs, are some of the factors that contribute to intra-group diversity. Yet, these factors are understudied. To fill this gap, we embarked on multiple research methodologies with the goal to better understand the influence of language factors in the health experiences and health outcomes of the largest ethnic/linguistic minority in the nation.

Specifically, we explored two research questions:

1. Among Hispanic/Latino community residents with varying degrees of English language proficiency, we sought to better understand their experience of healthcare discrimination.
2. Among Hispanic/Latino legal immigrants, we sought to understand if language ability and language preference are independent predictors of self reported health at the population level.

We conducted two studies to research these questions:

1. We used a qualitative design with six online modified focus groups to explore healthcare discrimination amongst 33 Hispanic/Latino participants from Connecticut and Texas. Three groups consisting of self-identified English language proficient participants and three groups consisting of self-identified limited English proficient participants were empaneled for three days of discussion on healthcare experiences.
2. We conducted a cross sectional analytical study using the 2003 New Immigrant Survey, a nationally representative sample of adult legal Hispanic/Latino immigrants and limited the analysis to those born in Latin America (n=2885. 36.7% of total sample). The main dependent variable on our multivariate analysis was self-rated health. The main independent predictors in two models were self rated language proficiency and language preference at home respectively.

Our results showed:

1. Four novel themes captured unique perspectives of healthcare discrimination of our study participants across all focus groups. 1) Participants reported experiencing and observing healthcare discrimination; 2) Participants were motivated advocates for high quality care; 3) Participants prioritized several essential components in the provider-patient interaction beyond ethnic or language concordance; 4) Participants articulated clear standards to assess quality of care in healthcare interactions.
2. In our quantitative study, we found that among Hispanic/Latino legal immigrants, limited English proficiency status is a predictor of poor current self-rated health (unadjusted OR=2.9; 95% 2.2-3.7), even after adjusting for the effect of age at immigration, time of residency in the US, years of education and having a chronic disease (adjusted OR=1.6; 95% CI 1.1-2.3). Language preference was not associated with current self-rated health among Hispanic/Latino immigrants, after adjusting for confounding.

The conclusions from our study were:

1. Our findings highlight the broad diversity of knowledge and expectations that exist within this population. They can inform patient-provider interactions and increase satisfaction among the Hispanic/Latino population receiving healthcare and help mitigate the discrimination experiences.
2. The type of reported language measures made a difference to independently predict SHR among Hispanic/Latino immigrants. Speaking language preference at home may not be a valid measure of language barriers in health. The single item to measure English language proficiency appears as a simple and consistent measure to predict immigrant population health.

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Introduction

Hispanic/Latinos are the fastest growing racial/ethnic minority in the United States and are often treated as a monolithic group in health disparities research. Language ability and preference, two distinct linguistic constructs, are some of the factors that contribute to intra-group diversity. Yet, these factors are understudied. To fill this gap, we embarked on multiple research methodologies with the goal to better understand the influence of language factors in healthcare discrimination experiences and health outcomes of the largest ethnic/linguistic minority in the nation. First, we explored healthcare discrimination experiences in Hispanic/Latino participants with different degrees of language proficiency through a qualitative study. Subsequently, we conducted a quantitative study to investigate if language ability and language preference are independent predictors of self-reported health at the population level in a sample of H/L immigrants. The subsequent chapters describe in detail each study.

Chapter 1

Understanding Patient Reported Experiences of Healthcare

Discrimination: Insights from Spanish-language speakers

Background

Patient-reported healthcare discrimination is associated with several negative health outcomes. (1-14) Prior studies have found an association between patient-reported healthcare discrimination and individuals delaying filling prescriptions (3), greater medical distrust and poorer adherence to therapy (5), decreased ratings of healthcare quality (8), and not being up-to date with recommended preventative screenings. (10) A cross-sectional study using data from the 2001 California Health Interview Survey showed a statistically significant association between reported healthcare discrimination and low receipt of cholesterol testing, hemoglobin A1c testing, eye exams among patients with diabetes, and flu shots. (15)

Population based survey studies show that the proportion of patients reporting having experienced discrimination in the healthcare setting based on race/ethnicity is 9.1%, with H/L at 28%. (16) Further, one third of physicians in a national sample reported witnessing racial/ethnic discrimination directed towards patients. (17-19) However, while Hispanic/Latino patient ethnicity is sometimes disaggregated in this research (16) few identified studies consider English language proficiency as an independent correlate of reported healthcare discrimination.

Because healthcare interactions for people who identify as H/L are uniquely shaped by both ethnic and linguistic minority status, we designed a qualitative study to gain a better understanding of how H/L patients with different levels of English proficiency define, identify, and respond to experiences of healthcare discrimination. We seek to understand what factors contribute to the perception of healthcare discrimination.

Statement of purpose, specific hypothesis and specific aims of the thesis.

Hispanic/Latinos are the fastest growing racial/ethnic minority in the US and are often treated as a monolithic group in health disparities research. We sought to explore and test the effect of language in the health of the Hispanic/Latino population, in an attempt to reduce healthcare disparities. We embarked on multiple research methodologies with the goal to better understand the influence of language factors in the health experiences and health outcomes of the largest ethnic/linguistic minority in the nation. Our first study was in the form of qualitative methodology.

This was a hypothesis generating research study.

Because healthcare interactions for people who identify as H/L are uniquely shaped by both ethnic and linguistic minority status, we designed a qualitative study to gain a better understanding of how H/L patients with different levels of English proficiency define, identify, and respond to experiences of healthcare discrimination.

Methods

I recruited participants, formed and moderated the online focus groups in Spanish and translated the transcripts into English by myself. I coded the transcripts independently along with two other researchers, and identified themes with them. (Marcella Nunez-Smith, MD, MHS and Rosana Gonzalez Colaso, PharmD, MPH).

Study Design

We used a qualitative methodological approach to characterize how English proficiency affects the healthcare experience of H/L patients in order to provide deeper insights into observed quantitative findings about healthcare discrimination. (20) Modifying a traditional focus group design, we chose to host moderated online forums to facilitate data collection unencumbered by location or time conflicts. In addition, the complex and nuanced topic under consideration favored a design allowing participants opportunities to contribute thoughtful narratives over a substantial time period (i.e., three days). (22) In our study, each forum group had access to a secure online forum within a parent study's social networking webpage (Patient Reported Experience of Discrimination in Care tool). Participants were able to freely post and reply anonymously to comments at their convenience in the webpage. The study was approved by the Yale University School of Medicine Human Investigation Committee (HIC) (#0704002559).

Study Population and Sampling

We recruited from across two demographically distinct states. In Connecticut, it is estimated that 14.7% of the population is H/L, and 5.8% of the total population is LEP. We decided to include a second site with a higher proportion of self-identified H/L individuals and purposefully selected Texas where H/L individuals are 38.4% of the overall population is H/L, and 14% are LEP.

The initial sampling frame was the key informant participant list from a Connecticut-based qualitative study on healthcare discrimination. Additional participants in CT and Texas were identified utilizing the snowballing method. (20) The snowballing method uses a small pool of initial informants to nominate, through their social networks, other participants who meet the eligibility criteria and could potentially contribute to the study. Potential participants were initially contacted via email with an invitation to participate. We chose this method of contact to screen out individuals who did not regularly use computers and might be unlikely to participate in an online focus group.

To be eligible, participants had to reside in the states of Connecticut or Texas, be at least 18 years of age, identify as H/L and as Spanish-language speaking, and must have had or observed a healthcare encounter within the prior 12 months.

Participants were excluded if they would not be able to access the forum group platform at least four times daily over the 3-day study period. After meeting initial eligibility criteria and consenting to participate, they were then purposefully

selected to populate the six predetermined focus groups, ensuring adequate representation by state and across two strata of self-identified language proficiency, i.e. English proficient and limited English proficient (Figure 1). Participants were selected on a rolling basis and individual focus groups were formed and scheduled when at least five individuals met the relevant English-language proficiency and state of residence criteria.

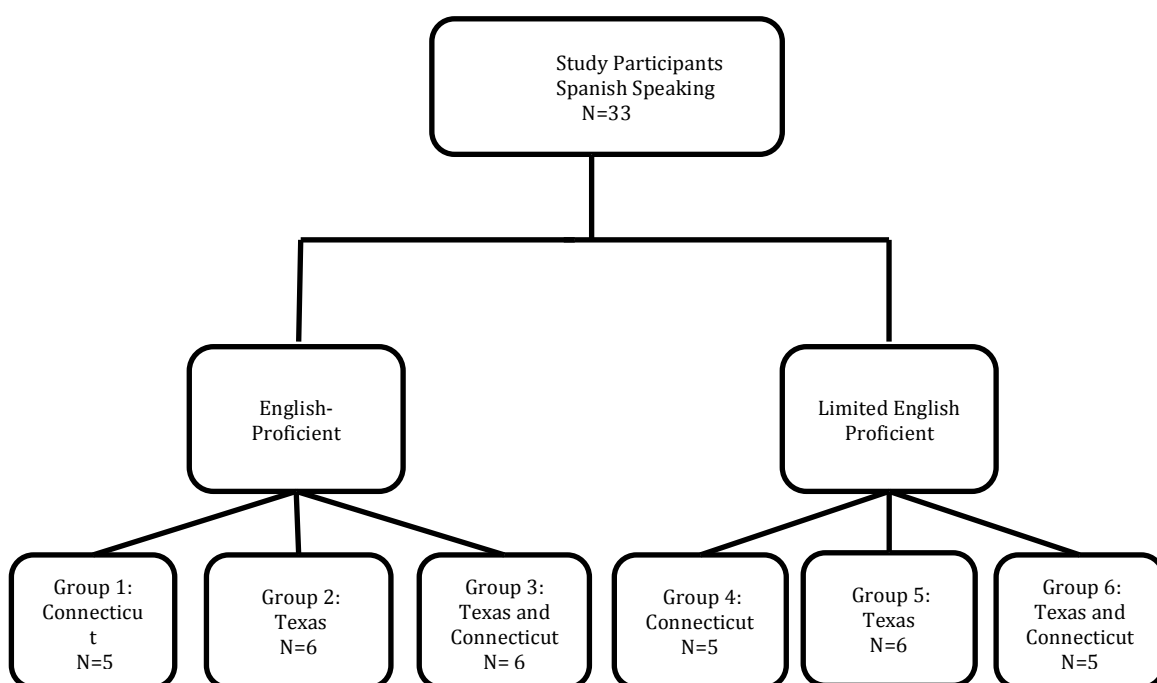


Figure 1: Composition of Focus Groups. Participants were categorized by state and English-language proficiency.

Data Collection

GMR conducted six online focus groups using a semi-structured interview guide to facilitate the online forums from October 2011-May 2012. Discussions began with the broad question “How does your ability to speak English influence your

interactions in health care settings, if at all?" Follow-up probes then examined the participants' experiences with healthcare discrimination. Additional questions asked participants how healthcare providers can make patients feel more welcomed. (See Table 1)

One bilingual member of the research team (GMR) moderated the focus groups posting questions and probes, checking the site at regular intervals to facilitate exchange of ideas as well as to remove any offensive content. A bilingual team member (RCG) would regularly log in to the forums to read and assess the content of the discussions and offered recommendations to the moderator on probes to fully elaborate on a topic. All online discussions were conducted in Spanish.

Each focus group had access to a secure online forum within the study's social networking webpage for participants to post and reply anonymously to comments at their convenience over a span of 3 days. Participants received daily e-mail reminders to log in and post. Two attempts to contact them via telephone or email were made if participants didn't log in to post in a 24-hr period.

A transcript of each focus group was transcribed into English (GMR) and then rechecked by another bilingual team member (RCG) for accuracy. All identifiable data were kept confidential including a demographics questionnaire that was part of the website sign-up process, secured and destroyed after the completion of the

study. Participants were sent a \$25 gift certificate at the conclusion of the study as compensation for their time and contribution.

1. How does your ability to speak English influence your interactions in health care settings, if at all?
2. Please discuss a time (or times) when you felt like you or a loved one was being treated unfairly or discriminated against when seeking healthcare? Why do you think that was? How did you or your loved one feel?
3. How can you recognize discrimination in healthcare?
4. What can healthcare providers do to make patients feel more welcome?

Table 1: Online Focus Group Interview Guide

Data Analysis

Using a grounded theory approach, the team developed an initial code structure based on preliminary reading of the first three focus group transcripts. Three members of the team (GMR, RGC, MNS) then line-by-line coded all six focus group transcripts, meeting in-person consistently to resolve any differences using the constant comparative method. The newly coded text was compared to previously coded text to expand on existing codes and to identify new ones. (21) GMR then applied the final code structure to all focus group transcripts with review by the other members of the teams.

Four themes ultimately emerged over the course of multiple meetings of the interdisciplinary team, including individuals with backgrounds in general internal medicine, public health, and outcomes research and the lived experience of being both Spanish and English language proficient. Our analysis focused on identifying unifying and recurrent thematic ideas, across levels of English proficiency and

across geographic locations that would characterize the experience of healthcare discrimination of monolingual and bilingual H/L individuals.

Results

Sample

We conducted six focus groups, each with 5-6 participants. We achieved equitable representation by state and level of English proficiency. Eighteen of the participants were from Texas (54.5%) and 15 participants resided in Connecticut (45.5%). (Table 2). Seventeen (51.5%) of the participants spoke English very well, and 16 participants were LEP (48.5%). We identified four unique themes across all groups, regardless of English proficiency or state of primary residence. (Table 3)

Characteristics	N (%)
Geographic Location	
Texas	18 (54.5%)
Connecticut	15 (45.5%)
English Proficiency	
English Proficient	17 (51.5%)
Limited English Proficient	16 (48.5%)
Age in years (Mean ± SD)	36.3 ± 14
Gender	
Female	25 (75.8%)
Male	8 (24.2%)
Ethnicity	
Mexican/Mexican American/Chicano	24 (81.8%)
Puerto Rican	3 (9.1%)
Other	3 (9.1%)

Table 2: Participant Characteristics

Themes
1. Participants reported experiencing and observing healthcare discrimination.
2. Participants were motivated advocates for high quality care.
3. Participants prioritized several essential components in the provider-patient interaction beyond ethnic or language concordance
4. Participants articulate clear standards to assess quality of care in healthcare interactions

Table 3: Four themes regarding the healthcare experiences of Hispanic/Latino Spanish speaking individuals.

Themes

Theme 1. Participants reported experiencing and observing healthcare discrimination regardless of English proficiency.

The broad question about healthcare interactions immediately and consistently elicited many comments about negative interactions participants attributed to their ethnicity, foreign accent, or real/perceived limited English language proficiency.

One participant described a time when her provider dismissed her symptoms of tingling and loss of arm sensation and being a “*mental problem.*” “*I think that my doctor thought I was a hysterical Puerto Rican woman,*” she stated. Another participant remembered the doctor’s frustration when she had to interpret the medical interview to her Spanish-speaking mother. “*It was obvious that the doctor*

got frustrated and that is why my mom felt uncomfortable, and she told me she preferred not to go to the hospital the next time.”

One participant described a discriminatory experience in the emergency department. She was suffering from continuous lower abdominal cramps and vaginal bleeding and had to wait many hours before being seen. She explained, *“I even had blood on my legs and some on the floor. I think they [providers] didn’t see me sooner because the other patients insisted to let them in because they speak English, while we [LEP patients] have to be almost down on the floor.”*

Another participant shared the anecdote of her brother who fell off hospital bed and was found bleeding. *“I also think they didn’t clean him because of racism. He gave off an alcohol smell since he drank a lot of beer, and that is why they left him there, but he was not drunk, however, the smell had penetrated his body already because he drank a lot. I also think [they didn’t wipe him clean] because my brother spoke only a little bit of English.”*

Moreover, participants described a wide variety of ways discrimination is expressed in healthcare. (Figure 2)

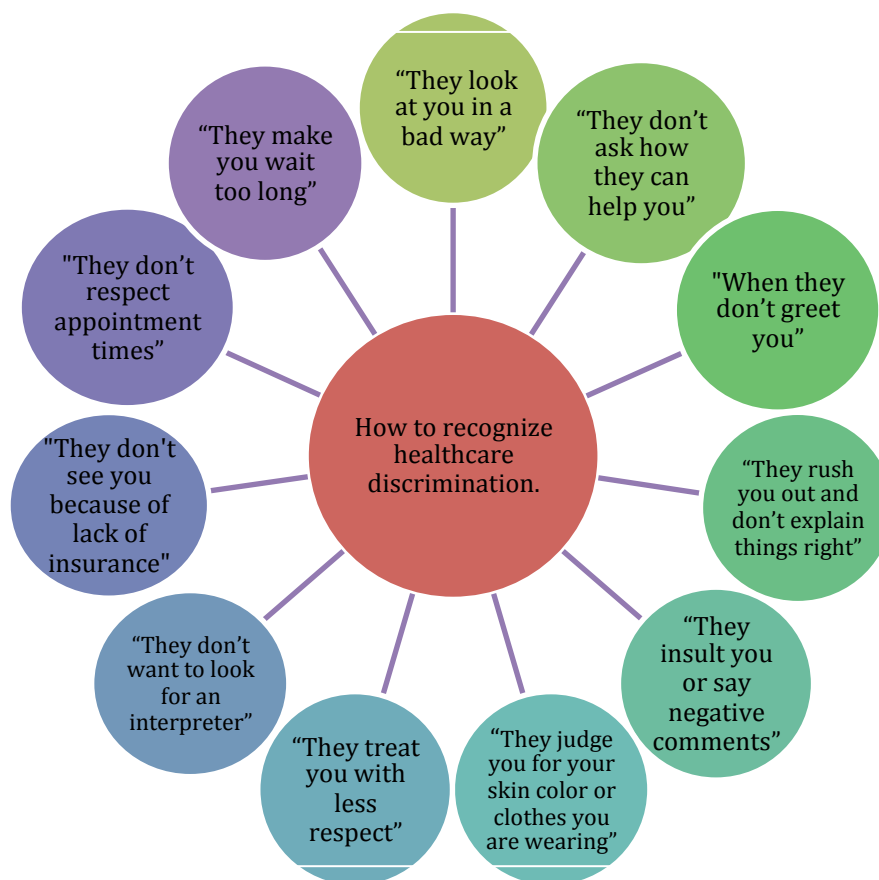


Figure 2: Recognizing healthcare discrimination.

"They" refers to healthcare providers.

Theme 2. Participants are self-advocates for high quality care by confronting or switching providers.

Participants became self-advocates when facing what they perceived as unfair medical treatment by voicing their concerns to the offending providers, reporting the experience to other healthcare workers, or seeking healthcare elsewhere.

One participant confronted a Spanish speaking emergency department doctor who had misdiagnosed a pleural effusion on his X-ray. He described the encounter as

follows: *"I went back to the doctor and I complained and I asked him why he had said that there was nothing wrong, and why he hadn't checked the X-ray well. The doctor got mad and left."* This participant played an active role in his healthcare by confronting the provider on missing a potentially dangerous diagnosis.

Additionally, another participant described an occasion when she helped her brother-in-law voice his discomfort towards the provider for feeling ignored in the emergency department after suffering a severe allergic reaction to seafood. The ED provider told him to *"toughen up"* and dismissed his pain symptoms. Since she worked in the healthcare system she felt empowered and felt *"so disappointed I let him [the provider] know."*

Other participants who avoided direct confrontation with the provider simply left to get medical attention at a different place. One female participant related the story of her pregnant friend who left the clinic and switched providers after having a negative healthcare experience: *"She was pregnant and the doctor told her that her baby was not developing well and that they had to terminate the pregnancy...then the nurse told her not to worry because she already had three kids and 'why would she want another one?' She felt discriminated and went to another hospital and her baby was born healthy without any problems."*

Theme 3: Participants prioritized several essential components in the provider-patient interaction beyond ethnic or language concordance.

Participants agreed that ethnic and language provider-patient concordance could be valuable in a healthcare visit. One participant described that sharing the same language with the provider allowed her to *“ask all the questions [she] wanted instead of feeling short of words”* when she struggled to describe a symptom in English. Another participant described that ethnic concordance *“made the patient feel connected and comfortable with the doctor.”* However, they emphasized that provider compassion, equal treatment, and clinical competency were more important than provider language linguistic or ethnic concordance.

Participants emphasized that a good patient-provider relationship was also based on the provider’s effort to make a personal connection. One comment was that *“providers from a different cultural background are more aware of making someone of a different ethnicity feel comfortable and are more likely to ask for more of an understanding of that person’s ethnicity.”*

The importance of a physician’s *“expertise”* when selecting providers was highlighted during the discussion. For one of the participant’s newly diagnosed lupus, she *“prefer[s] someone who has a lot of knowledge on the disease even if he/she does not speak Spanish.”* The physician she selects should be a *“leader in his/her field”* and she reviews their *“research, reputation, awards, and rating of other*

patients” before making a decision. She wants to be *“treated by the best doctor—even if he is not Hispanic—that’s not too important.”*

Participants appreciated being kept well informed by the provider regarding their medical care. One male participant described a positive experience in a hospital Emergency Department after being involved in a falling accident. *“The doctors were very nice and explained everything to me before the surgery... about the procedures... I liked that they kept me informed, asking me how I felt with a few doctors coming close and explaining [the steps] the whole time.”*

Another participant stressed that being well informed during uncomfortable medical visits was helpful to relieve anxiety. She described her medical experience with a male provider during the physical exam as positive since, *“He would tell me step by step what he was doing and why, and what he thought of what he was seeing or of what I was saying.”*

One of the female participants explained her views on information sharing during a visit with the dermatologist, *“She treated me really well, and talked to me about the treatment options for acne. She listened to my questions and she also explained to me why she was giving me each medicine. I really liked the experience.”* According to her the doctors should take time to explain the diagnosis and explain the medications

and *“not only expect us to take them, but actually explain what they are for, and the side effects. I like to be well informed.”*

Theme 4. Participants articulate clear standards to assess efficiency in healthcare interactions.

For participants there was not one unified, consistent definition of high quality care. Participants had a strong command on quality of care. For example, participants highly valued efficient medical visits. They described cumbersome experiences that slowed down the visit, such as using an interpreter, and praised providers who offered “fast treatment.”

Despite the availability of interpreting services in place to help limited English proficient patients, some participants described the inefficiencies of these services. A patient described his experience with an interpreter during a medical visit, *“I do use an interpreter so that I can be more clear, I can speak a little English but I can understand it better. One of the problems is the time inconvenience because sometimes it is something simple but when we go and wait for the interpreter to get there or when they dial the phone it’s a waste of time when it could have been something faster.”*

Furthermore, a good healthcare experience was often based on how fast participants were treated. A limited English proficient female described how

satisfied she was when her relative received “fast” healthcare, *“When I had a relative that had a car accident and he was very sick, they helped us and supported us a lot, and the doctors were very attentive, he was very sick, and the doctors when he got there were very patient with me and they were very fast and they did a lot of things very fast.”* Another LEP female similarly equates fast paced treatment with the quality of care given by providers, *“I knew they were taking good care of me because everyone was moving fast—while someone removed the glass from my hair, another one gave me a shot, and the other one cleaned the blood, and everyone treated me well.”*

Discussion

This study systematically explored the self-reported healthcare discrimination experiences of Spanish-speaking patients. Despite selecting key informants from two states and with differing degrees of English language proficiency, common themes emerged across all focus groups. Experiences of healthcare discrimination were familiar to our participants who were able to describe specific negative experiences in detail. Four novel themes captured unique perspectives of our study participants across all moderated forum groups. Participants reported experiencing and observing healthcare discrimination regardless of English proficiency, they were motivated advocates for high quality care, they prioritized several essential components in the provider-patient interaction beyond ethnic or language concordance, and articulated clear standards to assess quality of care in healthcare interactions, specifically efficiency.

Our findings provide additional context to quantitative studies that have found that H/L patients report a higher incidence of healthcare discrimination than Caucasian patients due to race and ethnicity. (16) Similarly, we found that H/L patients regardless of English proficiency have experienced discrimination in a healthcare encounter. However, some of our findings offer a unique perspective not currently reflected in the published literature. Participants linked how they were treated directly with quality of care and were able to clearly articulate the characteristics that make for high quality healthcare interactions. It was notable that a positive healthcare experience in this H/L population went beyond ethnically and linguistically matching patients and providers, but from humanistic qualities such as respect, compassion, empathy, rapport building, and content expertise that was communicated fully. Contrary to the common belief that the H/L population has been characterized as preferring a paternalistic style of medical care with studies showing that Hispanics are more likely to delegate decisions about treatment to their physicians (22-24), we found that H/L participants are actively seeking to be more involved in their medical care. They value information sharing and desire to be well informed regarding their treatment options. Also of note was the degree to which this group advocated for self and loved ones, reporting discrimination and seeking other care settings. This finding runs counter to findings that show the H/L population to have a preference for an indirect, non-confrontational style of communication as part of its culture (25), and that respect towards an authority figure, such as a healthcare providers, can lead patients to avoid disagreement or expressing doubts about their treatment. (26)

We offer insights into a growing and changing H/L population. In the United States, 16.9% of the population self-identifies as H/L, representing the fastest growing ethnic minority group. (27) Within the H/L population, two-thirds of persons 5 years or older speak Spanish, and almost half of them have limited English proficiency. (28) Our findings are important because they can inform patient-provider interactions and increase satisfaction among H/L population receiving healthcare. Strengths of our online qualitative study include that it relied on a novel approach of utilizing online focus groups to discuss healthcare discrimination among H/L population with Spanish-speaking participants, which has not been reported in the literature. By using this approach, we were able to elicit sensitive information in a confidential, anonymous manner. One of the limitations of the study is that our research design does not allow for triangulation because of lack of collateral data. In addition, our participant pool is limited to two states and may reflect a more educated population that has computer and internet access. It could additionally potentially exclude the more marginalized H/L population.

The research findings can inform how best to measure healthcare discrimination within this group using confidential online focus groups with clear policy implications for designing strategies to improve their healthcare experience. The findings can also inform patient-provider interactions and help educate providers on the different values that the H/L population cherishes and mitigate the experience of healthcare discrimination. Future quantitative studies should analyze discrimination experiences amongst H/L population with varying levels of English proficiency to further explore this topic at a national level.

We learned of the importance of involving patients in determining what is important in their healthcare experience and what defines quality. A national focus on this issue has been reflected in the creation of the Patient-Centered Outcomes Research Institute (PCORI). PCORI is a nonprofit, nongovernmental organization established in 2012 as part of the Affordable Care Act of 2010 whose goal is to support research that addresses the questions and concerns most relevant to patients and help people make informed healthcare decisions that reflect their desired health outcomes. Importantly, PCORI places a strong emphasis on engaging patients and broader healthcare community in all their research efforts. (34) The 2012 IOM report *Partnering with Patients to Drive Shared Decisions, Better Value, and Care Improvement - Workshop Proceedings* also calls to empower patients to become active partners in their health care as a critical step to achieve the best care. (35) Our work further demonstrates the critical role of the patient voice in healthcare quality measurement and underscores the role that experiences of discrimination should play in the quality and equity of care paradigm.

Chapter 2

Predicting Immigrant Health: Does Language Measure Matter?

Background

English language proficiency and language preference are commonly used as predictors of disparities among linguistic minorities. Both types of language measurements have been used interchangeably in public health research and have previously been associated with high disease prevalence, less preventive care services, and poor health related outcomes, such as self reported health, a marker of increased mortality, across different racial/ethnic groups. However, few studies have studied the effect of language exclusively in immigrants. (29-33)

Understanding immigrant's health determinants are key to reduce health disparities. In 2012, 13% of US were immigrants, 89% of immigrant households spoke a foreign language, more than half the adult immigrants spoke English less than very well, and 52% were born in Latin America. (34) Therefore, a large proportion of immigrants are considered Hispanic/Latino (H/L), and Spanish language is the most common language spoken in addition to English in the US.

Language proficiency and preference may explain H/L immigrant health through different mechanisms. English language proficiency is a skill and it has been consistently measured as the ability to speak English using a single question "How well would you say you speak English?" with a 4-point Likert-scale response option (very well, well, not well, not at all) High proficiency has been considered an

indicator of greater acculturation (35, 36) and a key resource for accessing U.S. health services. Speaking English less than very well, also known as having limited English proficient (LEP), has been associated to negative patient's healthcare experiences and outcomes. LEP individuals are less likely to have a regular source of primary care (37), receive fewer preventive health services (38), have lower medication adherence, and have lower patient satisfaction compared to those with greater English proficiency. (39, 40)

In contrast, the significance and measurement of language preference is less consistent in predicting immigrant health. Scholars argue that English-language preference may represent a negative aspect of acculturation due to immigrants' adoption of unhealthy "American" lifestyles (41, 42) or it could be a proxy for greater acceptance of health promoting practices such as cancer screening. (43-45) A third perspective yet considers English language preference as a proxy for English proficiency, which facilitates patient physician communication and greater access to healthcare. (31) However, this assumes that English language proficiency influences English language preferences, and that may not necessarily be true among recent immigrants or those with strong social networks in a particular language.

Moreover, great variation also exists in the operationalization of language preference measures across studies. Most commonly, language preference has been measured as self-reported language spoken at home, or with friends, but also as the language an individual feels more comfortable writing and reading. (46) Recently, however, language preference has been measured indirectly by the respondent's

choice of interview language. (33, 47-49) This makes the interpretation and comparability of results difficult.

Both language measures have been used to predict self-rated health (SRH) among H/L and others. Limited English proficiency status has been consistently associated with poor SRH, a population level predictor of mortality (50) among several racial/ethnic minorities . (35, 46, 51, 52) Some of those studies have focused exclusively in immigrants of Asian and African origin, and the studies targeting the H/L population also included the US born and failed to account for pre-migration variables that could confound the association under study. This creates an opportunity for further exploration.

Moreover, evaluation of language preference and SRH among immigrants aimed to test both bilingual and monolingual choices for communication. Bilingualism may reflect a “cultural flexibility” to navigate more easily the medical system in both the host and native country, translating into better SRH. (53) Bilingual preference was found to be significantly associated to better self reported health than monolingual preference among Asian and H/L immigrants. (53)

In this study, the construct to assign bilingual preference relied on assessment of reading, writing and speaking proficiency and not on self-reported language preference. (53)

Among H/L, native language preference was significantly associated to having poor or fair health status than English speaking, when preference was ascertained indirectly among a sample of US and foreign born H/L. (33) When direct measure of

language preference were used with Asian immigrants, however, native language preference was not significantly associated with SRH. (46) To our knowledge, no study has explored direct measures of language preference among H/L immigrants.

Despite these findings, it is still unclear if SRH can be predicted by measures of language proficiency, language preference, or both among H/L immigrants; the largest linguistic minority in US.

To fill that gap, our study aims to:

- 1) Describe the prevalence of poor self-rated health among a national representative population sample of H/L immigrants.
2. Evaluate if English proficiency is an independent predictors of SRH among a national representative population sample of H/L immigrants.
3. Evaluate if language preference is an independent predictors of SRH among a national representative population sample of H/L immigrants.

Statement of purpose, specific hypothesis, and specific aims of the thesis.

Hispanic/Latinos are the fastest growing racial/ethnic minority in the US and are often treated as a monolithic group in health disparities research. Language ability and preference, two distinct linguistic constructs, are some of the factors that contribute to intra-group diversity. Yet, these factors are understudied. We sought to explore and test the effect of language in the health of the Hispanic/Latino population, in an attempt to reduce healthcare disparities. We embarked on multiple research methodologies with the goal to better understand the influence of language factors in the health experiences and health outcomes of the largest ethnic/linguistic minority in the nation.

We hypothesize that the prevalence of poor self-rated health will be greater among immigrants with limited English proficiency than among those with greater proficiency. We also hypothesize that the prevalence of poor self-rated health will be greater among H/L immigrants who prefer speaking Spanish only than among bilingual/English speakers.

Among Hispanic/Latino legal immigrants, our aim was to understand if language ability and language preference are independent predictors of self-reported health at the population level utilizing a cross-sectional analysis method.

Methods

I learned how to use SPSS and analyze data from an Epidemiology PhD student, Laura Skrip, and then I conducted the statistical analyses under her supervision.

Study Design and Study Sample

We conducted a cross sectional analytical study using the 2003 New Immigrant Survey, a national representative multi-cohort longitudinal study of new legal immigrants adults, compiled by the U.S. Immigration and Naturalization Service. The sampling frame was based on national representative samples of administrative records for new immigrants (N= 8,573, Response rate: 68.6%) at least 18 years of age, admitted to permanent residence to the United States from May to November 2003. The baseline survey was conducted from June 2003 to June 2004. (NIS-2003-1). Interviews were conducted in person or by phone in the respondents' preferred language. The geographic sampling design includes all top 85 Metropolitan Statistical Areas (MSAs) and all top 38 counties and to select a random sample of 10 MSAs from among the rest of the MSAs and a random sample of 15 county pairs from among the rest of the counties. (54) In our study, only adult legal H/L immigrants who were born in Colombia, Cuba, Dominican Republic, El Salvador, Guatemala, Mexico, Peru, and other Latin American countries were included (n=2885). This represents 33.7% of the survey respondents. The New Immigrant Survey was limited to these countries.

Measures

The main dependent variable to rate overall health status was SRH. Respondents answered the question “Would you say your health is excellent, very good, good, fair or poor?” Consistent with other studies (50, 51, 55, 56) the responses were aggregated, dichotomized, and recoded. SRH responses “excellent” plus “very good” were recoded as 1 (reference group). SRH responses “good” plus “fair” plus “poor” were recoded as 0. According to previous studies the response “good” has been associated with higher mortality than the “excellent/very good” categories, so it is considered more similar to the “fair/poor” response categories. (51, 57)

The main independent variable was language proficiency for model 1 and language preference for model 2. Language proficiency was ascertained by a trained interviewer in person or over the phone, by using a single question “How well would you say you speak English?” A 4-point Likert-scale response option was used to differentiate four levels of English proficiency (very well=1, well=2, not well=3, not at all=4). Similarly to other studies (51), responses were aggregated, dichotomized and recoded as “Limited English Proficiency” (Speaking English well, not well and not at all) and “Non Limited English Proficiency” (Speaking English very well)=reference group).

Language preference was collected by the same trained interviewer in person or over the phone using a single question, “What languages do you currently speak at home?” This is the most common way language preference is captured. Respondents were allowed to list all languages spoken at home. Responses were recategorized as

English-only speaker=1, Spanish language speaker=2, Bilingual=3. English speakers were selected as the reference group.

Control variables include demographics, acculturation variables, and health status. Socio-demographic variables included gender, age at interview, marital status, employment status, education, age at interview was calculated by subtracting year of interview from year of birth. (58) Education was recoded as a dichotomous categorical variable, "<12 years" and ">12 years." Marital status was dichotomized into not married (separated, divorced, widowed, or never married, and not living with someone in a marriage-like relationship)=0 and married=1. (51)

Acculturation variables included country of origin, duration of residence in the U.S., and age at immigration. Duration of residence in the US was calculated by subtracting year of migration from year of interview, and grouped into three categories including <1 year, 1-4 years, and >5 years. (51, 58) Year of migration was based on the respondent's answer to the NIS-2003 survey item: "In what month and year did you first leave (country of origin) to live in another country for at least 60 days?" Age at immigration to the US was calculated by subtracting duration of residence from age at interview, and grouped into four categories (<20, 21-30, 31-40, and >41 years).

Lastly, health status and medical care access variables include chronic disease, pre-migration SRH, smoking status, heavy drinking, and health insurance status. Pre-migration SRH was measured by a 5-point Likert scale question to rate respondents health while they were growing up, from birth to age 16 from "excellent" = 1 to

“poor” = 5 (recoded “excellent/very good” = 1 and “good/fair/poor” = 0. (55, 56) In our study, chronic disease was defined as the presence of one or more of the following chronic diseases: high blood pressure, diabetes or high blood sugar, cancer or a malignant tumor, chronic lung disease, heart problems, arthritis or rheumatism, asthma, and frequent pain. A dichotomous chronic disease variable was created and defined as: having one or more chronic diseases = 1 and not having any chronic diseases=0. (51)

Statistical Analysis

All statistical analyses were run using SPSS software. We generated descriptive statistics and univariate analyses using means and standard deviations for continuous variables and frequencies for categorical variables to describe the study sample.

Also, we conducted chi square (χ^2) bivariate analyses to examine unadjusted associations of language proficiency and preference with the main dependent variable SRH and with potential effect modifiers (gender, marital status, education, secondary acculturation predictors: country/region of origin, duration of residence, and age at immigration), and confounders (pre-migration SRH, chronic disease). Unadjusted odds ratios and 95% confidence intervals were estimated, and tests of significance were performed to compare proportions using a significance level of 5%. By using model of best fit (Forward Walt), we conducted multivariate analyses to examine the adjusted associations of language proficiency and preference and SRH.

Results

Univariate Analysis

The average age of our H/L immigrant sample was 39.64 years, 55.4% were female, 68.5% were married and 72.2% had completed less than 12 years of education.

(Table 1) Of the total sample, 40.14% were born in Mexico, 16.63% were born in in El Salvador, 6.55% were born in in Guatemala , 5.75% were born in in Dominican Republic , 5.06% were born in Cuba , 4.61% were born in Colombia, 3.92% were born in Peru, and 17.33% were born in other Latin American countries.

On average, the H/L immigrants had resided in the US for about 9.25 years, and were around 30.3 years of age at the time of immigration (range of 0-85 years of age). On average, Salvadorian immigrants were younger at the time of immigration (24.16 years) and had resided in the US for longer (13.52 years) compared to immigrants of other countries. Immigrants from the Dominican Republic had resided in the US for a shortest amount of time (1.86 years), 80.7% of them had resided in the US for less than 1 year, and were oldest at the time of immigration (40.16 years of age). (Table 1)

The majority of the H/L immigrants were healthy based on the reported excellent (31.2%) or very good (24.8%). current self-rated health, excellent (49.8%) or very good (24.4%) pre-migration self rated health, and low prevalence of chronic disease in an adult population (19%). (Table 2)

Demographic Characteristics	Total sample N(%)	Colombia (n=133)	Cuba (n=146)	Dominican Republic (n=166)	El Salvador (n=480)	Guatemala (n=189)	Mexico (n=1158)	Peru (n=113)	Other Latin America countries (n=500)
Age (yrs) at interview Mean (SD) Range	39.64(14.10) 18-88	43.50 (15.51) 18-83	39.08 (11.05) 20-72	42.20(15.44) 18-85	37.50(10.32) 18-81	38.42(11.37) 18-81	40.02(15.66) 18-88	40.20 (12.58) 19-79	39.44(14.26) 18-85
Gender Male Female	1286 (44.6%) 1599 (55.4%)	52 (39.1%) 81 (60.9%)	76 (52.1%) 70 (47.9%)	71 (42.8%) 95 (57.2%)	239 (49.8%) 241 (50.2%)	91 (48.1%) 98 (51.9%)	457(39.5%) 701 (60.5%)	49 (43.4%) 64 (56.6%)	251 (50.2%) 249 (49.8%)
Marital Status Married No Yes	909 (31.5%) 1975 (68.5%)	43 (32.3%) 90 (67.7%)	45 (30.8%) 101 (69.2%)	91 (54.8%) 75 (45.2%)	163 (34.0%) 317 (66.0%)	62 (32.8%) 127(67.2%)	283 (24.5%) 874 (75.5%)	37 (32.7%) 76 (67.3%)	185 (37.0%) 315 (63.0%)
Education (yrs of school) Mean (SD) Range <12 ≥12	9.91 (5.06) 0-33 2083 (72.2%) 795 (27.6%)	12.47 (4.74) 0-22 65 (48.9%) 68 (51.1%)	13.06 (3.70) 3-25 84 (57.5%) 62 (42.5%)	9.58 (4.97) 0-25 127 (76.5%) 39 (23.5%)	8.77 (4.66) 0-30 392 (82.0%) 86 (18.0%)	8.35 (4.59) 0-20 155 (82.0%) 34 (18.0%)	8.54 (4.92) 0-23 937 (81.0%) 220 (19.0%)	14.41 (3.66) 5-24 40 (35.4%) 73 (64.6%)	12.30 (4.51) 0-33 283 (57.1%) 213 (42.9%)
Age at Immigration to US (yrs) Mean (SD) Range <20 21-30 31-40 ≥41	30.3 (15.97) 0-85 799(29.6%) 888 (32.9%) 426 (15.8%) 581 (21.5%)	36.29(16.10) 8-78 18 (14.4%) 38 (30.4%) 25 (20.0%) 44 (35.2%)	34.67(12.42) 4-69 11(7.8%) 47 (33.3%) 45 (31.9%) 38 (27.0%)	40.16(16.09) 8-85 12 (7.5%) 34 (21.1%) 52 (32.3%) 63 (39.1%)	24.16(10.51) 3-76 170 (37.4%) 201 (44.3%) 57 (12.6%) 26 (5.7%)	25.51(11.68) 1-67 56 (31.3%) 86 (48.0%) 23 (12.8%) 14 (7.8%)	29.87(18.00) 0-84 410 (39.0%) 298 (28.3%) 92 (8.7%) 252 (24.0%)	34.56(13.44) 6-79 16 (15.2%) 26 (24.8%) 30 (28.6%) 33 (31.4%)	31.77 (15.25) 0-85 106 (22.2%) 158 (33.1%) 102 (21.4%) 111 (23.3%)
Duration of residence in the US (yrs) Mean (SD) Range <1 1-4 ≥5	9.25 (8.51) 0-65 641 (23.7%) 379 (14.0%) 1681 (62.2%)	6.82 (9.90) 0-61 47 (37.0%) 25 (19.7%) 55 (43.3%)	4.38 (6.82) 0-43 34 (24.1%) 67 (47.5%) 40 (28.4%)	1.86 (5.04) 0-33 130 (80.7%) 10 (6.2%) 21 (13.0%)	13.52 (5.48) 0-41 30 (6.6%) 9 (2.0%) 419 (91.5%)	12.93 (5.54) 0-31 14 (7.8%) 4 (2.2%) 161 (89.9%)	9.93 (8.82) 0-65 198 (18.8%) 148 (14.1%) 707 (67.1%)	5.59 (6.76) 0-26 42 (40.0%) 20 (19.0%) 43 (41.0%)	7.65 (9.11) 0-64 146 (30.6%) 96 (20.1%) 235(49.3%)

Table 1: Demographics of H/L Legal Immigrants in 2003 by Country of Origin

(N=2885)

Health Characteristics	Total sample (N=2885) N(%)
Current Self-Rated Health	
Excellent	843 (31.2%)
Very good	670 (24.8%)
Good	819 (30.3%)
Fair	331 (12.3%)
Poor	38 (1.4%)
Pre-migration SRH	
Excellent	1344 (49.8%)
Very good	659 (24.4%)
Fair	436 (16.1%)
Poor	138 (5.1%)
Chronic Disease	
No	2204 (76.4%)
Yes	548 (19.0%)
Alcohol (days/week)	
>1 Days	303 (13.0%)
≤1 Days	1980 (87.0%)
Smoking Status	
Yes	241 (9.0%)
No	2357 (91.0%)

Table 2: Health Characteristics of H/L Legal Immigrants

Language Characteristics	Total sample (N=2885) N(%)
English Language Proficiency	Total sample (N=2885) N(%)
Very Well	339 (11.8%)
Well	543 (18.8%)
Not Well	970 (33.6%)
Not at all	874 (30.3%)
Limited English Proficient	2387 (82.7%)
Language Preference	
Bilingual	774 (26.4%)
English	105 (3.6%)
Spanish	1719 (59.6%)

Table 3: Language Characteristics of H/L Legal Immigrants

With regards to language preference, 59.6 % spoke Spanish at home, 3.6% spoke English, and 26.8% were bilingual. In terms of English ability, 11.8% spoke English very well, and 82.7% were classified as LEP status (18.8% spoke English well, 33.6% did not speak English well and 30.3% did not speak English at all). (Table 3)

Table 4 shows the analysis of English proficiency by language preference at home. It shows that amongst those who speak Spanish at home, the majority (96%) is LEP, while 75% of the bilingual, and 45% of those who prefer speaking English at home are LEP.

Language Measure		English Language Proficiency	
		Non Limited English Proficiency	Limited English Proficiency
Language Preference at Home	English	58 (55%)	47 (45%)
	Bilingual	194 (25%)	580 (75%)
	Spanish	73 (4%)	1644(96%)

Table 4: Analysis of English Proficiency by Language Preference at Home

Bivariate Analyses

Country of origin, duration of residence in the US, age of immigration to the US, education, chronic disease, and gender were significantly associated with English language proficiency and with language preference (Spanish speaker, English speaker and bilingual) in a bivariate analysis. However, pre- migration SRH and being married was only associated with language proficiency. Significant unadjusted bivariate associations were found between current SRH and English proficiency, language preference, country of origin, duration of residency, age at immigration, pre-migration self rated health, gender, marriage, diagnosis of chronic diseases and years of school completed.

Table 5 shows the bivariate analysis of SRH by type of language measure. We found that the quality of self-rated health decreases with diminishing levels of English proficiency. Among those who speak English very well, 76% reported excellent or very good self-rated health. In contrast, only 58% of the LEP group reported excellent or very good self-rated health. We also found a similar dose response trend with respect to language preference, with the highest proportion of excellent and very good self-rated health among those who prefer speaking English at home (76%), followed by those who are bilingual (62%), and the least proportion among those who prefer speaking Spanish (52%) at home.

Language Measure	Self-Rated Health	
	“Very Good/Excellent”	“Poor/Fair/Good”
English Proficiency		
Very Well	257 (76%)	82 (24%)
Well	365 (67%)	178 (33%)
Not well/not at all	885 (48%)	959 (52%)
Limited English Proficiency	1250 (52%)	1137 (48%)
Language Preference at Home		
English	78 (74%)	27 (26%)
Bilingual	477 (62%)	297 (38%)
Native language	886 (52%)	833 (48%)

Table 5: Bivariate Analysis of Self-Rated Health by Language Measure (N=2726).

Lower N is due to no reporting/missing data.

Multivariate Analyses

After controlling for the effect of demographic, health status, and pre-migration confounders, we found that the association between limited English proficiency and SRH was mitigated but remained strong. (Unadjusted OR 2.9 (CI 2.2—3.7), Adjusted OR 1.6 (CI 1.1—2.3)). H/L immigrants with limited English proficiency had higher odds (1.6) of rating their current as good/fair/poor than those who spoke English very well. In contrast, while language preference was initially strongly associated to SRH, there was no association after adjusting for the effect of confounders (Unadjusted OR for Spanish speakers 2.7 (CI 1.7—4.3), Adjusted OR for Spanish speakers 1.5 (CI 0.8—2.7)). (Table 6)

Language Measure	Unadjusted OR (95% CI)	P value	Adjusted OR** (95% CI)	P value
English Proficiency				
Non Limited Proficiency	Ref	Ref	Ref	Ref
Limited Proficiency	2.9 (2.2-3.7)	0.000	1.6 (1.1 - 2.3)	0.018
Language Preference at Home				
English	Ref	Ref	Ref	Ref
Bilingual	1.8 (1.1-2.9)	0.013	1.2 (0.7-2.2)	0.532
Spanish	2.7 (1.7-4.3)	0.000	1.5 (0.8-2.7)	0.199

Table 6: Multivariate Analysis of Poor Self-Rated Health by Language Measures (n=2726)

**Adjusted for age at immigration, years in the US, pre-migration health, insurance status, marriage status, chronic disease presence, gender & years of education.

Discussion

English language proficiency and language preference are commonly used as predictors of disparities among linguistic minorities.

This study tested two language measures to predict self-rated health among a large nationally representative sample of legal H/L immigrants; currently the largest linguistic minority and foreign-born minority group in the US. Our analyses showed that English language proficiency matters to explain disparities among self-reported health amongst the H/L immigrant population. We found that the prevalence of poor self-reported health is greatest among LEP immigrants and those who prefer speaking Spanish at home. Our findings also show that LEP status is an independent predictor of poor self-rated health among H/L immigrants but language preference at home is not.

Our study adds to other quantitative studies that have examined language measurements and SRH by focusing exclusively on H/L immigrants. Our findings are similar to those by Gee et al who tested the equivalence of both types of language measures (proficiency versus preference) among a sample of Asian immigrants to the US by using a different nationally representative sample of immigrants to the US. (46) While their study tested multiple items and different statistical ways to evaluate language preference, they also found a strong positive association between language proficiency and SRH but no association with language preference.

Our study also confirms the results of the several studies that had explored the use

of a single item to evaluate language proficiency among different samples of H/L, without a clear distinction of immigration status. (35, 53) However, our study findings about language preference refute the findings that English language preference, and bilingualism, is protective for SRH among H/L. (53, 59) The differences in our findings might be explained by restricting our sample to H/L by immigration status, the operationalization of language preference, or, most likely, by our robust multivariate model that account for the effect of multiple confounders relevant to the association.

Our study has several strengths. First, this is the first study that evaluates the predictive value of two commonly used language measures among a large nationally representative sample of H/L adult immigrants in the US. Second, our study operationalize the language measures under study using the most common methods previously reported in the literature, which allows for comparability of results. Third, the study focuses on a recent sample of H/L legal immigrants to the US, which represent the largest foreign-born group and ethnic and linguistic minority during the last decades.

The main limitations of our study responds to the cross sectional nature of the design which prevents making inferences about causal associations between language proficiency and SRH. Second, it relies of a single year sample of legal immigrants in the US in 2003, which is the most recent available study of H/L immigrants. Lastly, our study fails to include undocumented immigrants and seasonal migrant workers, which represents a large proportion of the H/L

population.

Our study findings have important implications for public health research. An impending executive order on immigration policy could increase dramatically the number of new legal H/L immigrants in future years by regularizing the situation of many undocumented parents of US born children and young adults who had entered the US illegally as children. (60) These large influxes of new immigrants are not represented in large population studies, and may pose unique challenges to the public health and clinical sectors. We recommend relying on a simple and robust measure of language proficiency when planning large population studies. We believe measures of language preference might be more useful measure for clinical than population levels studies. Language preference may be more important in the clinical setting to evaluate patient-centered needs with the goal of improve quality of care among linguistic minorities, and language proficiency may be more useful in population studies. Future studies should examine how language is measured in the clinical setting, how LEP patients are identified, and whether preference versus ability makes a difference to predict health outcomes. Our work further demonstrates the importance of taking into account the role of language in the study of health care disparities, by highlighting the importance of valid methods to identify vulnerable linguistic minorities when the goal is to achieve quality and equitable care.

References

1. Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*. 2003;93(2):200-8.
2. Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. *Journal of Behavioral Medicine*. 2009;32(1):20-47.
3. Van Houtven CH, Voils CI, Oddone EZ, Weinfurt KP, Friedman JY, Schulman KA, et al. Perceived discrimination and reported delay of pharmacy prescriptions and medical tests. *Journal of general internal medicine*. 2005;20(7):578-83.
4. Todorova IL, Falcon LM, Lincoln AK, Price LL. Perceived discrimination, psychological distress and health. *Sociology of health & illness*. 2010;32(6):843-61. doi:<http://dx.doi.org/10.1111/j.1467-9566.2010.01257.x>
5. Thrasher AD, Earp JAL, Golin CE, Zimmer CR. Discrimination, distrust, and racial/ethnic disparities in antiretroviral therapy adherence among a national sample of HIV-infected patients. *Journal of acquired immune deficiency syndromes*. 2008;49(1):84-93. doi:10.1097/QAI.0b013e3181845589
6. Thorburn S, Bogart LM. African American women and family planning services: perceptions of discrimination. *Women & health*. 2005;42(1):23-39.
7. Stuber J, Galea S, Ahern J, Blaney S, Fuller C. The association between multiple domains of discrimination and self-assessed health: a multilevel analysis of Latinos and blacks in four low-income New York City neighborhoods. *Health Serv Res*. 2003;38(6 Pt 2):1735-59.
8. Sorkin DH, Ngo-Metzger Q, De Alba I. Racial/ethnic discrimination in health care: impact on perceived quality of care. *Journal of general internal medicine*. 2010;25(5):390-6.
9. Sohn L, Harada ND. Effects of racial/ethnic discrimination on the health status of minority veterans. *Military medicine*. 2008;173(4):331-8.
10. Shariff-Marco S, Klassen AC, Bowie JV. Racial/ethnic differences in self-reported racism and Its association with cancer-related health behaviors. *American Journal of Public Health*. 2010;100(2):364-74. doi:10.2105/AJPH.2009.163899
11. Schulz AJ, Gravlee CC, Williams DR, Israel BA, Mentz G, Rowe Z. Discrimination, symptoms of depression, and self-rated health among African American women in Detroit: Results from a longitudinal analysis. *American Journal of Public Health*. 2006;96(7):1265-70.
12. Piette JD, Bibbins-Domingo K, Schillinger D. Health care discrimination, processes of care, and diabetes patients' health status. *Patient Education & Counseling*. 2006;60(1):41-8.
13. Penner LA, Dovidio JF, Edmondson D, Dailey RK, Markova T, Albrecht TL, et al. The experience of discrimination and black-white health disparities in medical care. *Journal of Black Psychology*. 2009;35(2):180-203. doi:10.1177/0095798409333585
14. Pascoe EA, Richman LS. Perceived Discrimination and Health: A Meta-Analytic Review. *Psychological Bulletin*. 2009;135(4):531-54.

15. Trivedi AN, Ayanian JZ. Perceived discrimination and use of preventive health services. *Journal of General Internal Medicine*. 2006;21(6):553-8.
16. LaVeist TA, Rolley NC. Prevalence and patterns of discrimination among US health care consumers. *Int J Health Serv*. 2003;33(2):331-44. doi:Doi 10.2190/Tcac-P90f-Atm5-B5u0
17. Nunez-Smith M, Curry LA, Bigby J, Berg D, Krumholz HM, Bradley EH. Impact of race on the professional lives of physicians of African descent. *Ann Intern Med*. 2007;146(1):45-51.
18. Nunez-Smith M, Curry LA, Berg D, Krumholz HM, Bradley EH. Healthcare workplace conversations on race and the perspectives of physicians of African descent. *Journal of general internal medicine*. 2008;23(9):1471-6. doi:Doi 10.1007/S11606-008-0709-7
19. Nunez-Smith M, Pilgrim N, Wynia M, Desai MM, Bright C, Krumholz HM, et al. Health care workplace discrimination and physician turnover. *Journal of the National Medical Association*. 2009;101(12):1274-82.
20. Malterud K. The art and science of clinical knowledge: evidence beyond measures and numbers. *Lancet*. 2001;358(9279):397-400. doi:Doi 10.1016/S0140-6736(01)05548-9
21. Miles MB HA. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd ed ed. Thousand Oaks, California: Sage Publications; 1994.
22. Wallace LS, DeVoe JE, Rogers ES, Malagon-Rogers M, Fryer GE. The medical dialogue: Disentangling differences between hispanic and non-hispanic whites. *Journal of general internal medicine*. 2007;22(11):1538-43. doi:Doi 10.1007/S11606-007-0368-0
23. Levinson W, Kao A, Kuby A, Thisted RA. Not all patients want to participate in decision making - A national study of public preferences. *Journal of general internal medicine*. 2005;20(6):531-5. doi:Doi 10.1111/J.1525-1497.2005.0088.X
24. Murray E, Pollack L, White M, Lo B. Clinical decision-making: Patients' preferences and experiences. *Patient Educ Couns*. 2007;65(2):189-96. doi:10.1016/j.pec.2006.07.007
25. Singleton K, Krause EM. Understanding cultural and linguistic barriers to health literacy. *Kentucky nurse*. 2010;58(4):4, 6-9.
26. *The Provider's Guide to Quality and Culture: Challenges to Health and Well-Being of Hispanic/Latino Communities*. Management Sciences for Health (MSH). 2008.
<http://erc.msh.org/mainpage.cfm?file=5.4.5c.htm&module=provider&language=English>. 2014.
27. HISPANIC OR LATINO ORIGIN: Total population
2012 American Community Survey 1-Year Estimates. United States Census Bureau. 2012.
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_1YR_B03003&prodType=table.
28. Baptiste M. Racism in psychiatry. *Nursing Standard*. 2001;15(16):24-5.
29. Fiscella K, Franks P, Doescher MP, Saver BG. Disparities in health care by race, ethnicity, and language among the insured - Findings from a national sample. *Med Care*. 2002;40(1):52-9. doi:Doi 10.1097/00005650-200201000-00007

30. Derose KP, Baker DW. Limited English proficiency and Latinos' use of physician services. *Med Care Res Rev.* 2000;57(1):76-91.
31. Solis JM, Marks G, Garcia M, Shelton D. Acculturation, Access to Care, and Use of Preventive Services by Hispanics - Findings from Hhanes 1982-84. *American Journal of Public Health.* 1990;80:11-9. doi:Doi 10.2105/Ajph.80.Suppl.11
32. Flores GF, Abreu M, Tomany-Korman SC. Limited English proficiency, primary language at home, and disparities in children's health care: How language barriers are measured matters. *Public Health Reports.* 2005;120(4):418-30.
33. DuBard CA, Gizlice Z. Language Spoken and Differences in Health Status, Access to Care, and Receipt of Preventive Services Among US Hispanics. *American Journal of Public Health.* 2008;98(11):2021-8. doi:Doi 10.2105/Ajph.2007.119008
34. Immigration Statistics. Department of Homeland Security. 2013. <http://www.dhs.gov/immigration-statistics>. Accessed December 4 2014.
35. Kandula NR, Lauderdale DS, Baker DW. Differences in Self-Reported Health Among Asians, Latinos, and Non-Hispanic Whites: The Role of Language and Nativity. *Annals of Epidemiology.* 2007;17(3):191-8. doi:<http://dx.doi.org/10.1016/j.annepidem.2006.10.005>
36. Finch BK, Vega WA. Acculturation stress, social support, and self-rated health among Latinos in California. *Journal of immigrant health.* 2003;5(3):109-17.
37. Weinick RM, Krauss NA. Racial/ethnic differences in children's access to care. *Am J Public Health.* 2000;90(11):1771-4.
38. Woloshin S, Schwartz LM, Katz SJ, Welch HG. Is language a barrier to the use of preventive services? *Journal of general internal medicine.* 1997;12(8):472-7. doi:Doi 10.1046/J.1525-1497.1997.00085.X
39. Andrulis D GN, Pryor C. What a difference an interpreter can make: Health care experiences of uninsured with limited English proficiency. http://www.accessproject.org/downloads/c_LEPresources.pdf. Accessed August 26 2014.
40. David RA, Rhee M. The impact of language as a barrier to effective health care in an underserved urban Hispanic community. *Mt Sinai J Med.* 1998;65(5-6):393-7.
41. Detjen MG, Nieto J, Trentham-Dietz A, Fleming M, Chasan-Taber L. Acculturation and cigarette smoking among pregnant Hispanic women residing in the United States. *American Journal of Public Health.* 2007;97(11):2040-7. doi:Doi 10.2105/Ajph.2006.095505
42. Marsiglia FF WM. Language preference and drug use among southwestern Mexican American middle school students. *Children and Schools.* 2002;24(3):145-58.
43. Ponce NA, Chawla N, Babey SH, Gatchell MS, Etzioni DA, Spencer BA, et al. Is there a language divide in Pap test use? *Med Care.* 2006;44(11):998-1004. doi:Doi 10.1097/01.Mlr.0000233676.61237.Ef
44. Crespo CJ, Smit E, Carter-Pokras O, Andersen R. Acculturation and leisure-time physical inactivity in Mexican American adults: results from NHANES III, 1988-1994. *Am J Public Health.* 2001;91(8):1254-7.
45. Stein JA, Fox SA. Language Preference as an Indicator of Mammography Use among Hispanic Women. *J Natl Cancer I.* 1990;82(21):1715-6. doi:Doi 10.1093/Jnci/82.21.1715

46. Gee GC, Walsemann KM, Takeuchi DT. English proficiency and language preference: testing the equivalence of two measures. *Am J Public Health*. 2010;100(3):563-9. doi:10.2105/AJPH.2008.156976
47. Viruell-Fuentes EA, Morenoff JD, Williams DR, House JS. Language of interview, self-rated health, and the other Latino health puzzle. *Am J Public Health*. 2011;101(7):1306-13. doi:10.2105/AJPH.2009.175455
48. Abdulrahim S, Baker W. Differences in self-rated health by immigrant status and language preference among Arab Americans in the Detroit Metropolitan Area. *Soc Sci Med*. 2009;68(12):2097-103. doi:10.1016/j.socscimed.2009.04.017
49. LJ Phillips RH, JM Blanton. Predictors of self-rated health status among Texas residents. *Prev Chronic Dis*. 2005;2(4):1-9.
50. DeSalvo KB, Bloser N, Reynolds K, He J, Muntner P. Mortality prediction with a single general self-rated health question. A meta-analysis. *Journal of general internal medicine*. 2006;21(3):267-75. doi:10.1111/j.1525-1497.2005.00291.x
51. Okafor MT, Carter-Pokras OD, Picot SJ, Zhan M. The relationship of language acculturation (English proficiency) to current self-rated health among African immigrant adults. *Journal of immigrant and minority health / Center for Minority Public Health*. 2013;15(3):499-509. doi:10.1007/s10903-012-9614-6
52. Franzini L, Fernandez-Esquer ME. Socioeconomic, cultural, and personal influences on health outcomes in low income Mexican-origin individuals in Texas. *Soc Sci Med*. 2004;59(8):1629-46. doi:10.1016/j.socscimed.2004.02.014
53. Schachter A, Kimbro RT, Gorman BK. Language proficiency and health status: are bilingual immigrants healthier? *J Health Soc Behav*. 2012;53(1):124-45. doi:10.1177/0022146511420570
54. The New Immigrant Survey. Princeton University. 2004. <http://nis.princeton.edu/index.html>. Accessed June 6, 2014 2014.
55. Wake M, Canterford L, Patton GC, Hesketh K, Hardy P, Williams J, et al. Comorbidities of overweight/obesity experienced in adolescence: longitudinal study. *Arch Dis Child*. 2010;95(3):162-8. doi:10.1136/Adc.2008.147439
56. Stevens GD. Gradients in the health status and developmental risks of young children: the combined influences of multiple social risk factors. *Maternal and child health journal*. 2006;10(2):187-99. doi:10.1007/s10995-005-0062-y
57. Desalvo KB MP. Discordance between physician and patient self-rated health and all-cause mortality. *Ochsner J*. 2011;11:232-40.
58. Roshania R, Narayan KMV, Oza-Frank R. Age at Arrival and Risk of Obesity Among US Immigrants. *Obesity*. 2008;16(12):2669-75. doi:10.1038/Oby.2008.425
59. Pearson WS, Ahluwalia IB, Ford ES, Mokdad AH. Language Preference as a Predictor of Access to and Use of Healthcare Services among Hispanics in the United States. *Ethnicity & Disease*. 2008;18(1):93-7.
60. The DREAM Act. Immigration Policy Center. 2012. <http://www.immigrationpolicy.org/issues/DREAM-Act>. Accessed January 5 2015.

