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ESSAYS ON GENDER, ETHNICITY, AND HEALTH IN THE UNITED STATES AND TURKEY

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BY

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ABSTRACT

This dissertation is composed of three studies examining barriers to health and healthcare that affect individuals on the basis of their race, ethnicity, and gender. The first study examines access to care disparities between non-Hispanic whites and Hispanics. I find that observed characteristics explain all of the disparities in access to care between these two groups, a marked change from a decade ago when characteristics explained only 65 percent. However, disparities in access to care between women and men remain unexplained even when differences in their attitudes and beliefs regarding healthcare are controlled for, especially for Hispanic men and women.

Diversifying the healthcare workforce is often prescribed as a way to improve healthcare access for minorities in the U.S. In the second study, I explore whether concordance between provider and patient based on race, ethnicity, or gender influences patient satisfaction with their providers. Findings show that diversifying the workforce in terms of race and ethnicity may not be enough to improve the quality of care and satisfaction with care for minority individuals, especially Hispanic men, who appear to be less satisfied when treated by Hispanic medical providers.

Barriers to health in developing countries go beyond access to medical care and may be related to an individual's social status. Using data from Turkey, the third study asks whether or not a mother's autonomy affects her children's health. Findings show that a mother's autonomy measured by her level of conformance to traditional gender norms has long-term consequences for her children's nutritional status, especially for girls.

DEDICATION

To the most extraordinary woman in my world, my mom,

Meryem Kucukgode.

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And finally I am deeply thankful to my husband Ali, my daughter Elif, and my son Mehmet. I survived this experience because of your patience, love, and support.

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List of Abbreviations

AAMC: Association of American Medical Colleges
ACA: Patient protection and Affordable Health Care Act
AHRF: Area Health Resource File
AHRQ: Agency for Healthcare Research and Quality
BMI: Body Mass Index
HRSA: Health Resource and Service Administration
MEPS: Medical Expenditure Panel Surveys
MSA: Metropolitan Area Status
NHIS: National Health Interview Survey
OLS: Ordinary Least Squares
PCA: Principal Component Analysis
SCHIP: State Children's Health Insurance Program
TDHS: Turkish Demographic and Health Survey
WHO: World Health Organization

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Chapter 1: Introduction

1.1 Background

Good health is widely considered a human right, one that is unequally distributed among populations. A great deal of research is aimed at understanding why health is disproportionately distributed and developing ways in which we can ensure more equitable distribution of resources and good health outcomes for everyone. Conditions vary on the basis of context and the nature of health outcomes among populations, but there are numerous ways in which seeking to improve health could provide lasting benefits to individuals everywhere.

In the United States the Healthy People 2020 report has identified improving access to health care services as an important objective in the development of American population health. The explicit goal is to improve access to comprehensive, quality health care services. Doing so would decrease negative impacts on individual and community health by providing an ongoing source of care, a primary care provider that patients can communicate with and trust, and access to services and diagnostic tools that help prevent illness and aid in the early detection and treatment of illness (Healthy People 2020 report).

The initiatives outlined in Healthy People 2020 are also believed to be necessary steps in reducing health and health care disparities between populations in the United States. Hispanics have been identified as suffering disproportionately from barriers to health care, and research has shown that these disparities are pernicious and complex. Research into these disparities has attempted to explain them on the basis of a number of individual and community characteristics; however, disparities do not disappear when these characteristics are accounted for. Various policy initiatives have put forth ways to measure and track and

ultimately reduce these disparities, and a number of possible solutions have been proposed. Chapters 2 and 3 in this dissertation focus on two points of entry into this discussion: the complex nature of the barriers to care experienced by Hispanics and one of the potential ways in which the relationship between patient and provider are affected by the racial and ethnic characteristics of both.

The World Health Organization has determined a set of goals concerning population health that include eliminating hunger, empowering women, reducing child mortality, and improving maternal health (WHO, 2000). These goals address individual health outcomes through improving social circumstances and access to resources. These goals are linked to studies that have shown that barriers to health may not be limited to the structure of a country's health care system and access to that system but are also related to individual social context. Poor nutritional status and low growth attainment in children are health concerns that have only marginal connection to the health care systems of individual countries. Research in developing countries has found that a mother's social condition interacts with her child's nutritional status and health; however, this is context-specific, and few studies account for mothers' social conditions. In chapter 4 I investigate these conditions in Turkey and whether a mother's social context and her level of adherence to traditional gender roles are barriers to her children's health.

These are just a few of the myriad ways in which health determination is affected in the United States and the developing world, providing many opportunities for advancing research, thereby working to improve the health outcomes of vulnerable populations. Growing awareness of these inequalities make it imperative to address the structural barriers faced by all people, and to that end the studies here aim to inform the economics literature on

the difficulties individuals face when accessing care and achieving health. The ultimate goals of this work are to inform policy development and resource allocation and, ultimately, to reduce disparities and improve health for the populations studied here.

1.2 Chapter Outlines

This dissertation is composed of three studies examining barriers to health and healthcare that affect individuals in the United States and Turkey on the basis of their race, ethnicity, and gender. I present a detailed background, analyses, and discussion of findings in chapter 2, chapter 3, and chapter 4, and I provide concluding remarks in chapter 5. An overview of the each of these chapters is presented in this section.

In chapter 2 I explore the access to care disparities and provide an update for the causes of the health care access disparities among Hispanic and Non-Hispanic whites. Despite the vast array of access to care disparities literature, no studies have been able to fully explain the factors associated with access to care disparities, creating challenges to providing a clear and articulated strategy to eliminate these disparities. In this study I took an innovative approach by using non-linear decomposition methods to examine new and unique data sets provided to me by the Agency for Health Care Research and Quality in Washington D.C. This data allowed me to examine not only individual characteristics but also information regarding the health care supply capacity and community characteristics for Hispanic and non-Hispanic whites who participated in the 2009, 2010, and 2011 Medical Expenditure Panel Surveys (MEPS).

I was able to explain all of the disparities in access to care between non-Hispanic whites and Hispanics, something no other previous study has been able to do. Findings highlight the importance of providing health insurance, which has the potential to decrease

barriers to access to care. Increasing insurance coverage rates is one way to diminish barriers to access to care, but findings from this chapter show that there are other non-financial barriers that must be understood and incorporated into policy recommendations in order for these disparities to be fully addressed and overcome.

I also hypothesize that there are differences in the perceptions, needs, abilities, and attitudes between women and men that need to be incorporated in access to care disparities research. Taking these differences into consideration provides important insight into disparities in access to care which may lead to more accurate policy recommendations. I find that there is heterogeneity between women and men, some of which comes from differences in their attitudes and beliefs regarding health care and their participation in public health insurance. Hispanic women are much more likely than Hispanic men to have a regular source of care. Therefore, my study underscores the problem with prescribing a blanket remedy for all Hispanics.

In chapter 3 I continue my study of the MEPS data I used in chapter 2 in order to determine the effects of various types of patient-provider concordance or non-concordance on Hispanics' satisfaction with the health care system. I measure satisfaction based on a set of questions that determine an individual's perception of the patient/provider encounter. The literature has found mixed results in regard to the factors driving patient satisfaction based on concordance for Hispanics. My study aims to provide greater insight into whether or not diversifying the health care workforce will improve Hispanics' satisfaction with the health care they receive from their provider.

My findings show that even when controlling for acculturation, Hispanic men are more likely to be dissatisfied with some aspects of their medical care when they are racially

and ethnically concordant with their provider. Hispanic women are, in general, statistically indifferent to that concordance (racial and ethnic and gender) in terms of overall satisfaction with their care. Therefore, my study underscores the need for additional considerations in medical training to help physicians make a "match" with their patients regardless of any type of observable concordance.

In chapter 4, I explore whether women's social context in Turkey has health consequences for her children such as nutritional status and growth attainment. Studies done for other developing countries have demonstrated the importance of a woman's autonomy on child health outcomes through improved childcare practices, utilization of health services, and dietary intake. And while there are studies that explore the determinants of children's nutrition status in Turkey, the importance of gender roles and women's autonomy have been overlooked in the empirical analyses. In order to address this gap in the literature, I investigate links between a mother's autonomy and her children's health outcomes.

Using the 2008 Turkish Demographic and Health Survey (TDHS), I find that the children of more traditional women suffer the worst health outcomes, especially girls. I also find that female children fare better in nutritional status when they are raised in households with more highly educated fathers. My findings indicate that there is room to improve childhood nutrition in Turkey, and therefore a child's life chances, with policies that support women's autonomy and investments in education, particularly for men.

Chapter 2: Update on Racial Disparities in Access to Health Care: An Application of Non-linear Decomposition Techniques

2.1 Introduction

Access to medical care and health care utilization is a topic of considerable interest among public health and health care services researchers. Gaining access to and utilizing health services are essential in order for individuals to receive diagnosis of adverse health conditions, avoid hospitalizations and emergency hospital care, and improve health outcomes. However, studies show that racial and ethnic disparities in health care have persisted for decades (Smedley, Stith, and Nelson, 2003; Derose, Gresenz, and Ringel, 2011). Evidence suggests that minorities are less likely to be insured, less likely to have a regular source of care, and less likely to receive timely needed care compared with their white counterparts (Lillie-Blanton, Maleque, and Miller, 2008; National Healthcare Quality and Disparities Report, 2011; Kirzinger, Cohen, and Gindi, 2011).

A number of scholarly works have attempted to quantify and statistically explain the socioeconomic characteristics, health insurance coverage rates, and other factors that contribute to the disparities in access to health care. For instance, lack of health insurance has been consistently found to be one of the main contributors. However, the extent to which access to health insurance can explain disparities in access to care varies depending on the comparison group, and disparities in access to care exist even among the insured (Zuvekas and Taliaferro, 2003; Kirby, Taliaferro, and Zuvekas, 2006). Furthermore, even when socioeconomic characteristics, language barriers, and health insurance coverage are controlled for, previous studies were not able to fully explain access to care disparities, especially between Hispanics and non-Hispanic whites, creating challenges to providing a clear and articulated strategy to eliminate these disparities.

Since access to care disparities persist, updating the literature is essential to continue moving toward solutions. To do this, I examine new and unique data sets provided to me by the Agency for Health Care Research and Quality. This allowed me to examine not only individual characteristics but also the health care supply capacity and community characteristics for Hispanic and non-Hispanic whites who participated in the 2009, 2010, and 2011 Medical Expenditure Panel Surveys. I examine the relative importance of these factors in contributing to access to care disparities and how much of the disparities they can explain using one of the non-linear decomposition techniques suggested by Yun (2004). I also employ Fairlie's (1999 and 2003) decomposition technique for sensitivity analysis purposes to show that my general results are not sensitive to the decomposition method that I am using. These non-linear techniques are well developed; however, there has been a lack of application in the access to health care literature (Williams, 2009).

In addition to new data and an updated methodological approach, I differentiate between genders to examine gender-specific differences that have been overlooked in the past by researchers who conflated the two categories (Kaiser, 2009). Taking gender differences into consideration could provide important insight into disparities in access to care. Therefore, this study blends a within and across gender perspective with Hispanic and non-Hispanic white group identification in an analysis of health care access disparities.

I find that differences in observed characteristics explain all of the disparities in access to care between non-Hispanic whites and Hispanics. In contrast, ten years ago the disparities couldn't be explained (Zukevas and Taliaferro, 2003; Hargraves and Hadley, 2003; Kirby, Taliaferro, and Zukevas, 2006). U.S. citizenship , English proficiency, and duration of health insurance coverage, as well as external factors such as neighborhood racial

and ethnic composition are the most significant and sizable observable characteristics that explain the disparities in access to care between these groups. However, disparities in access to care between women and men remain unexplained even when differences in their attitudes and beliefs regarding healthcare are controlled for, especially for Hispanic men and women.

2.2 Hispanic Population

Hispanics are the fastest growing populations and the largest minority groups in the United States, with Hispanic population growth in the last decade accounting for more than half (50.5%) of the total population growth in the U.S. (Brown and Lopez, 2013). According to the U.S. Census Bureau (2013), the Hispanic population was 53 million in 2012, or 17 percent of the overall population. Furthermore, the projected Hispanic population for the year 2060 is 128.8 million, which is projected to make up 31 percent of the overall population. The growth in the past decade has been ascribed to the natural increase in the existing population rather than immigration (Fry, 2008). Hispanics of Mexican origin represent the majority of Hispanics at 65.0 percent in 2011, followed by 9.4 percent of Puerto Rican origin, 3.8 percent Salvadoran origin, 3.6 percent Cuban, 3.0 percent Dominican, 2.3 percent Guatemalan, and the remaining with a Hispanic origin from other countries (U.S. Census Bureau, 2013).

Hispanics are heterogeneous among themselves, but there are several characteristics that set them apart from other non-Hispanics in the United States: a younger average age, lower levels of education, concentration in unskilled jobs, a common ancestral language, and a large share of undocumented immigration status among those who were foreign born (Tienda and Mithcel, 2006, page 2). These features are influential not only on Hispanics'

human capital but also on their health through lower levels of health insurance coverage and reduced access to care (Tienda and Mithcel, 2006).

2.3 Sources of Access to Care Disparities

It is important to emphasize that access to care is different from utilization of health care. Having access to care is the possibility of using medical services if required, whereas utilization is actual use of the medical services (Allin *et al.*, 2007). The equity principle prescribes that level of access to care and utilization should not vary based on patient characteristics such as racial and ethnic background (Betancourt *et al.*, 2014). However, previous studies have demonstrated that Hispanics have lower levels of access to care than non-Hispanic whites. Differences in health insurance coverage, language barriers, immigration status, and community characteristics are the most commonly cited explanations for access to care disparities.

2.3.1 Health Insurance Coverage

Having health insurance coverage is strongly associated with receiving timely and continuous care, and lack of it has been consistently found to be one of the main contributors to the disparities in access to healthcare (Institute of Medicine, 2001). Those with health insurance coverage have greater access to effective medical services and technologies, which tend to be more expensive (Sambamoorthi and McAlpine, 2003). Previous literature shows that Hispanics are more likely to be uninsured and less likely to be covered by employer-based health insurance than non-Hispanic whites (Schur and Feldman, 2001).

The causes of the low rates of health insurance coverage for Hispanics are multifactorial and in part tied to immigration status, English proficiency, employment characteristics, low take-up rate, and eligibility requirements for public health insurance

programs for low-income individuals (Escarce and Kaper, 2006). In particular, due to immigration status or lack of English proficiency, Hispanics tend to work at unstable and low wage jobs[1] that are less likely to offer health insurance benefits (Monheit and Vistness, 2000; Tienda and Mithcel, 2006; Fronstin, 2012). For instance, in 2012, 66.9 percent of non-Hispanic Whites had health insurance through their employer, compared to 38.8 percent of Hispanics (Fronstin, 2012), and some studies show that Hispanics are less likely to participate in employment-based health insurance coverage even if it was offered (Monheit and Vistness, 2000; Janicki, 2010) .

Furthermore, noncitizen and immigrant Hispanics are less likely to receive public health insurance under the restrictive eligibility rules for Medicaid and the State Children's Health Insurance Program (SCHIP), which may worsen their ability to access health care (Escarce and Kaper, 2006). Other studies point out that variation in health plans may be another possible source of health care access disparities. Racial and ethnic minorities tend to be enrolled in low quality health insurance plans that offer limited coverage benefits (Smedley, Stith, and Nelson, 2003).

In regards to the impact of having health insurance on access to care, Weinick, Zukevas, and Cohen (2000) measured the impact of income and insurance coverage on racial and ethnic access to care disparities. Their findings indicate that the elimination of income differences and insurance coverage inequality between minority groups and whites would reduce health care access disparities up to 20 percent; however, this would not eliminate the disparity problem altogether. In addition, both Zukevas and Taliaferro (2003)[2] and Hargraves

[1] Hispanics tend to work for small firms, work part time or at seasonal occupations, and are mostly employed in industries such as agriculture, construction, domestic and food services, and retail (Escarce and Kaper, 2006).
[2] Use 1996-1999 Medical Expenditure Panel Survey.

and Hadley (2003)[3] found that differences in insurance coverage explains one third of Hispanic-White disparities. Furthermore, Kang-Kim *et al.* (2008) examined the state level Hispanic/non-Hispanic white disparities in access to care and tested whether disparities changed over time from 1991 to 2004. The authors found that insurance and education were the main contributors to Hispanic-white disparities and that their impact had grown over the study period.

2.3.2 Immigration status and language barriers

Previous studies have shown that Hispanic immigrants face high barriers to access to care due to the lack of compatibility between the U.S. health care system and that of their native country, language barriers, and documentation status (Schur and Feldman, 2001; Lee and Choi, 2009; Bustamante *et al.*, 2010). Undocumented Hispanic immigrants are even more vulnerable to lack of access to care; they are 35 percent less likely to have a usual source of care compared to documented immigrants who are naturalized citizens or lawful permanent residents (Bustamante *et al.*, 2010).

Language barriers may create challenges to access to care for both patients and providers (Smedley, Stith and Nelson, 2003). When doctor and patient have a different ethnic background, communication problems may be accentuated because of language barriers, cultural differences, or both (Balsa and McGuire, 2001). For example, a provider may make treatment decisions based on the new information he obtains from a patient, visual observations (e.g. race, gender, age), and his prior beliefs about the likelihood of patient's conditions (Balsa, McGuire and Meredith, 2005). If the provider has difficulty in gathering accurate information from the patient, he may weigh prior beliefs more heavily and may not

[3] Use 1996-1999 Community Tracking Study.

find a well-suited treatment. This is an example of statistical discrimination[4] (Smedley, Stith, and Nelson, 2003). Thus, communication barriers may lower the accuracy of shared information and the quality of culturally competent care,[5] which could lead to inappropriate diagnosis and treatment and may adversely affect the quality of care for Hispanic individuals.

Lack of diversity in the health care workforce may contribute to the disparities in care (Betancourt, Green, and Carrillo, 2002). Minorities with a lower English proficiency are less likely to have a consistent and stable relationship with their providers (Smedley, Stith, and Nelson, 2003). Yet, studies find evidence that the quality of doctor-patient relationships can improve patient satisfaction, access to care, and lead to greater adherence to treatment and use of services (Ferguson and Candib, 2002). Although providing interpreters has been used to reduce language barriers, using untrained or ad-hoc interpreters may lead to inaccurate information and ethical concerns, and professional interpreters may interrupt the patient-provider relationship (Timmins, 2002). Racial concordance of patients and providers improves patient-provider communication, leads to longer office visits, increases patient satisfaction (Betancourt, Green, and Carrillo, 2002; Cooper *et al.*, 2003), and results in better health outcomes (Perez-Stable, Napoles-Springer, and Miramontes, 1997; Timmins, 2002).

Previous studies have analyzed the impact of language barriers on access to care disparities. For instance, Shi, Lebrun, and Tsai (2009), using the 2006 National Health Interview Survey, found that individuals with language barriers are less likely to have a health care visit compared to those who were proficient in English, while Fiscella *et al.*

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[4] "Statistical discrimination refers to how an agent (an employer, a doctor), without intending to discriminate, might apply an otherwise reasonable decision making rule (pay according to productivity, treat according to need), that in practice leads to unequal treatment of members of two ethnic groups" (Balsa and McGuire, 2001, page 881).

[5] Betancourt, Green and Carillo (2002) define cultural competence as "the ability of systems to provide care to patients with diverse values, beliefs and behaviors, including tailoring delivery to meet patients' social, cultural, and linguistic needs" (Betancourt, Green, and Carillo, 2002, page v).

(2002), using the 1996-1997 Community Tracking Survey, found that English proficiency is the largest contributor to the disparity among insured Hispanics and non-Hispanic whites.

2.3.3 Characteristics of Area of Residence

Community level factors and residential segregation may influence minorities' access to care (Andersen *et al.*, 2002; Smedley, Stith, and Nelson, 2003). Studies have found that community-level access to care varies significantly even after taking into account socioeconomic differences and need factors (Cunningham and Kemper, 1998, Andersen *et al.*, 2002). Community-level access to care disparities may be due to uneven allocation of resources at the state and local level, changes in health care delivery systems, market dynamics, and the strength of the regional economy (Andersen *et al.*, 2002). Considering that Hispanics and other low income minorities are more likely to use public safety net programs, the availability of community health centers and more generous public insurance eligibility criteria are important for improving their access to care. Other community characteristics include the level of community social capital,[6] improved access to care through improved local government functioning, physicians and insurance companies' engagement with local community, and better coverage from employers (Hendryx *et al.*, 2002).

Studies also find evidence that the racial and ethnic composition of the residing area matters; Blacks and Hispanics who live in communities with a higher prevalence of the same race and ethnicity perceive fewer barriers to access to care (Haas *et. al*, 2004). Kirby, Taliaferro, and Zukevas (2006) found that community racial and ethnic composition explains about 40 percent of the disparity in people's satisfaction with access to care between Hispanics and non-Hispanic whites. Surprisingly, supply of healthcare *measured* by the

[6] In Hendryx *et al.*, 2002, the level of community social capital is measured with the number of collaborations or partnerships with other states or community organizations.

number of physicians and the number of hospitals does not explain access to care disparities (Zukevas and Taliaferro, 2003; Kirby, Taliaferro, and Zukevas, 2006).

2.4 Theoretical Model

The relationship between health, medical care, and individual characteristics is widely studied in the health care literature (see Grossman, 1972; Strauss and Thomas, 1998). There is a consensus in the literature that demand for health care arises from its positive effects on health. Hence, individuals do not demand medical services for their own sake, but only its positive effects on health (Grossman, 1972). Therefore, individual utility can be derived from consumption (C), and good health (H):

$$U = U(C, H)$$

H reflects a production function similar to the health production function described in Strauss and Thomas (1998). In this model, health can be produced by investments in both healthy lifestyle behaviors (B) and medical service inputs (M). Healthy lifestyle behaviors can be time investments such as exercising and eating a healthy diet. Production of health also depends on technology parameters such as individual's socioeconomic characteristics (S), perceived health status, and attitudes towards health care. For instance, education improves the productivity of medical investments (i.e. more educated individuals are more likely to be aware of positive benefits of having a regular source of care and harmful health effects of smoking). Similarly, an individual's English proficiency affects her/his ability to seek and obtain health care and health information, therefore one's ability to produce health. Furthermore, as an individual gets older her health depreciates, and she is expected to allocate more resources in health production. An individual's propensity to produce health is also influenced by cultural beliefs, tastes, and her current health status (A).

Health production also depends on other factors that cannot be influenced by the individual such as environmental factors (E) and unobserved characteristics (μ) (e.g. genetic traits). Environmental factors can be level of pollution, availability of health care facilities, and racial and ethnic composition of their neighborhood, all of which can influence an individual's ability to produce health. For instance, the racial and ethnic composition of the neighborhood may determine the quantity and quality of social capital, and hence may enhance one's knowledge about the possible health care resources and about the benefits of having a regular source of care. Thus, the health production function is:

$$H = H(\, M, B;\; S, A, E, \mu)$$

Individuals allocate income between the consumption of goods and investment in medical services. Supposing that the individual earns an hourly income w, works L number of hours, and has non-labor income V, the budget constraint is:

$$p_c C^* + p_m^j M + p_{ins}^j Ins = wL - wN + V$$

where C^*corresponds to a vector of non-health consumption with prices p_c, and M corresponds to a vector of health inputs with prices p_m^j. Here, I assume that if the individual has health insurance they will pay a premium, and health insurance will lower the price of medical care. Therefore, j takes the value of 0 if individual is uninsured and 1 if individual is insured. p_{ins}^1 represents the price of having health insurance (if the individual is uninsured the cost of insurance is 0), p_m^0 represents full payment for medical inputs if the individual has no health insurance, and p_m^1 represents the out-of pocket of medical inputs depending on the individual's health insurance plan.

Here another cost of medical inputs can be the opportunity cost of having a doctor visit. Employees who are not paid when they see a provider incur a cost equivalent to their

opportunity cost (i.e. forgone income). Therefore, those individuals who are not paid to see a provider will incur an additional cost of wN, where N correspond to the number of hours spent to see a provider (N takes the value of 0 for those who are paid when they see a provider). Earning function w can be influenced by individual health (H), socio-demographic characteristics (S), such as education and parental background, local infrastructure (I), and skills of individuals (α):

$$w = w(H, S, I, \alpha)$$

Then the reduced form demand function for health input j can be derived:

$$M_j = M_j(p_m^j, p_{ins}^j, p_c, S, A, E, N, V, I, \alpha, \mu)$$

which depends upon observable characteristics such as prices (p_m^j, p_{ins}^j, p_c), socio-demographic characteristics (S), environmental characteristics (E), non-labor income (V), number of hours spent to see a provider (N), local infrastructure (I), skills (α), and genetic traits (μ).

This study concentrates on estimating one of the health input functions that enters to the health production function above. I assume that having access to care is a health input because individuals who report having a regular source of care are expected to have easier entry into the medical care system with more professional guidance. In light of the derived demand function above and available data, I group the variables that may impact access to care into three: *technology parameters* such as age, education, English proficiency, perceived physical and mental health status, and attitudes and beliefs towards health care; *prices and income* such as employment benefits, income status, and health insurance coverage; and finally *environmental characteristics* such as region, metropolitan area status, healthcare supply capacity, and racial and ethnic composition of area of residence.

2.4.1 Technology Parameters

Being older is expected to be positively associated with having a regular source of care. This may be due to adverse selection; older people may expect to get sick more often and/or their baseline health status may be worse than a younger cohort, thus they are more likely to maintain their access to health care (Long, 2008). Further, educated individuals are expected to be more efficient in using the health care services (Grossman, 1972). For instance, individuals with more education tend to be more aware of the need of having a regular source of care and engage in preventive care.

In addition, educated individuals tend to have higher expenditures on physician office visits (Buerhaus, Staiger and Uerbach, 2008). Therefore, education is expected to have a positive impact on having an access to care. Similarly, marital status is expected to increase the chances of having a regular source of care. The married couples are more motivated to have a regular source of care simply to protect their health and their family member's health. People with limited English proficiency are expected to have lower levels of access to care (Shi, Lebrun, and Tsai, 2009).

Cultural beliefs and tastes for health care may motivate individuals to use home remedies rather than technological treatments or to prefer non-traditional care over western medicine (Buerhaus, Staiger, and Uerbach, 2008). Therefore, cultural beliefs and attitudes are expected to have a significant impact on access to care behavior. Similarly, perceived physical and mental health status is also expected to have a significant impact on access to care seeking behavior. For instance, studies find evidence that individuals who report good or excellent health status are less likely to report having a regular source of care (Shi, Lebrun, and Tsai, 2009; Bustamente *et al.*, 2010).

2.4.2 Prices and Income

The MEPS does not have information on prices of medical care inputs. However, as mentioned earlier, health insurance reduces the cost of medical services (i.e. reduces out-of-pocket costs) and is expected to increase the demand for health care. Furthermore, wage information is not available in the MEPS; therefore I use income status as a proxy. Having higher income increases the affordability of health insurance coverage and other health care related expenses, thus it is expected to have a positive impact on having access to care. The impact of employment depends on the opportunity cost of the time spent to see a provider. Those who have lower opportunity costs would be more willing to have an access to care and utilize health care services (Buerhaus, Staiger, and Uerbach, 2008). Therefore, employment benefits, such as paid-leave time to see a provider, may positively affect the health care seeking behavior.

2.4.3 Environmental Characteristics

An individual's area of residence and their neighborhood characteristics are important due to their influence on access to social amenities and access to health care. For instance, one's area of residence may determine access to affordable housing, quality schools, public safety nets, transportation, and well-paying jobs, all of which significantly impact well-being (Tienda and Mitchell, 2006). As mentioned earlier, individuals living in communities with a higher prevalence of the same race and ethnicity perceive fewer barriers to access to care (Haas *et al.*, 2004). Therefore, neighborhood characteristics such as racial and ethnic composition and poverty status are expected to have a significant impact on access to care. The availability of health care resources, such as number of physicians and number of hospital beds per capita, may determine the receipt of timely care and length of wait time to

see a provider. Therefore, health care supply capacity is also expected to be influential on access to care.

2.5 Review of the literature

The literature review on the sources of access to care disparities revealed several important gaps in the literature. First, no one study has controlled all the relevant sources of disparities that have been identified to have an impact on health care access. For instance, Kirby, Taliaferro, and Zukevas (2006) do not control for the citizenship status, Hargraves and Handley (2003) do not control for language barriers, and others do not control for the health care supply capacity and community racial and ethnic composition. Second, other studies measured health insurance coverage as a binary outcome and captured static health insurance coverage during the year. However, duration of health insurance coverage may give more information on seeking access to care behavior. Third, previous studies did not have a gender perspective, nor did they consider the differences in need, perceptions, and preferences between men and women. The objective of this study is to fill in these gaps in the present access to care disparities literature.

2.6 Data

I make use of the household component of the Medical Expenditure Panel Survey (MEPS) to analyze the disparities in access to health care. The MEPS is sponsored by the Agency for Healthcare Research and Quality (AHRQ), and it provides comprehensive information on health care utilization, access to care, insurance coverage status, and health status along with socioeconomic characteristics for nationally representative, non-institutionalized U.S. population. The MEPS selects a new sub sample of approximately 15,000 households from the households that participated in the prior year's National Health

Interview Survey (NHIS) and collects data on each panel for two more calendar years. Data are gathered in five rounds of interviews with a single household respondent.[7]

In order to increase the sample size of the Hispanic subgroup, I combine data from the household component of the MEPS 2009, 2010, and 2011. However, publicly available MEPS data does not include citizenship status, external community factors such as community racial and ethnic composition, or health care system capacity variables, which appear to be important (Zukevas and Taliaferro, 2003; Kirby, Taliaferro, and Zukevas, 2006). Upon my request, the AHRQ linked these variables to individual respondents using additional data sources and stripped geographic identifiers from the resulting data file.[8] The AHRQ derived the variables regarding the community level characteristics from the 2010 Census and citizenship status from National Health Interview Survey. Similarly, the AHRQ derived variables regarding the health care system capacity from the Area Health Resource File (AHRF) sponsored by the Health Resource and Service Administration (HRSA).

I limit my sample to respondents who are between the ages of 18 and 64, since the access and utilization behavior of the elderly is a different category of research. I omitted pregnant women from my sample to avoid bias in access to care behavior as well as those who reported emergency room as a regular source of care, since emergency rooms are not designed to give the quality of care provided by a primary care physician (Miller, 2011). The combined data set has 11,565 non-Hispanic white women, 10,957 non-Hispanic white men, 6,907 Hispanic women, and 6,368 Hispanic men. The sampling designs play an important

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[7] The MEPS requires this respondent to be the family member most knowledgeable about health and health care use in the family. Furthermore, the MEPS is more periodic than other national surveys (5 months on average vs 12 months) thus it have lover recall period (Zuvekas and Olin, 2009). And although Zuvekas and Olin (2009) find that single respondents accurately report inpatient hospitalization but under report doctor visits, they also find that underreporting is similar across all socio-demographic groups; therefore, behavioral analysis would be unaffected (Zuvekas and Olin, 2009).

[8] The final MEPS data, including the 2010 Decennial Census and ARF variables, were available for my use on-site at the AHRQ data center.

role in making the data nationally representative, thus these designs are taken into account in my analysis.

2.6.1 Outcome Variable

The MEPS asks respondents whether there is a particular place that the individual usually goes to if he/she is sick or needs advice about his/her health. I construct having a regular source of care as binary outcome variable where 1 reflects a positive response to the above question. As shown in Table 2.1, non-Hispanic white women report significantly higher regular sources of care than Hispanic women. Whereas 82 percent of non-Hispanic white women report having a regular source of care, only 69 percent of Hispanic women report having one. Hispanic men report much lower levels of access to care. Only about 50 percent of Hispanic men report having a regular source of care, compared to 74 percent of non-Hispanic White men.

2.6.2 Explanatory Variables

I control for explanatory variables that have been identified in the economic model. I also control for fixed effects for survey years to adjust for any possible annual shocks.

Race and Ethnicity: The MEPS asks each respondent their race and ethnicity. If a respondent does not report their race and ethnicity during the interview, MEPS gathers race and ethnicity information from previous years' NHIS data or imputes it from the immediate family response. I categorize race and ethnicity as Hispanic (e.g. Puerto Rican, Cuban/Cuban American, Dominican, Mexican/Mexican American, Central or South American) and non-Hispanic white.

Age and Marital Status: Since the effect of age on access to care might be non-linear (Bustamante *et al.*, 2009), I grouped age into three categories: 18 to 34, 35 to 49, and 50 to

64. The MEPS updates marital status in each round of interviews. I use the end of year marital status to classify the current marital status into three categories: currently married, divorced, widowed or separated, and never married. I also measure the family size by the reported number of people in the family.

Language and Residency: The language in which the interview was completed is recorded by the interviewer. I used interview language as a potential proxy to measure language barriers, because no direct measure of language barriers exists in the MEPS. If a respondent completed the interview in English only, I assumed the respondent is comfortable speaking in English[9] as opposed to Spanish or both Spanish and English. Furthermore, I measured U.S. residency by three dichotomous variables: whether a respondent is a U.S. citizen and U.S.-born, whether a person is a U.S. citizen (naturalized) and non U.S.-born, or whether a person is a non-citizen.

Employment: The MEPS asks employment question to respondents 16 and older during each round. If a respondent is currently employed (or was employed any time during the interview round) the respondent is categorized as employed (otherwise as not employed). I separated employed status into two: paid-leave to visit a doctor and non-paid leave to visit a doctor.

Income Status: The MEPS reports the poverty status for each respondent by using measures of family income (adjusting for size and composition) and poverty statistics developed by the Current Populations Survey (CPS). The categories negative and poor (less than 100%), near poor (100% to less than 125%), and low income (125% to less than 200%) are categorized as “Low Income,” middle income (200% to less than 400%) is categorized as

[9] Coding the interview language to include both English and Spanish did not change the results.

"Middle Income," and high income (greater than or equal to 400%[10]) is categorized as "High Income" in this analysis.

Education: I used the highest degree at the time of the most recent round of interview as education measures: less than high school, high school degree or GED, and more than a high school degree.

Region and Metropolitan Area Status (MSA): Respondents were asked which Census region they reside within during the each round. I used the year end interview to determine the region in which each respondent lives. Appendix A shows which states each region includes. I also control for MSA status with a binary variable where 1 corresponds to living in MSA.

Insurance Status: The MEPS asks respondents comprehensive information on their health insurance coverage and reports whether a respondent was covered by public insurance or private insurance during each month. The MEPS classifies coverage such as Tricare, Medicare, Medicaid or SCHIP, or other public hospital and physician programs under public insurance. I created four health insurance categories to capture the duration and type of health insurance coverage that each respondent had during the full year: fraction of private coverage, fraction of public coverage, fraction of both private and public coverage, fraction of uninsured during the full year. For instance, a fraction of 1 for private coverage indicates that the respondent was fully covered by private insurance over the full year.

Perceived Health Status: Perceived health status measures reflect self-reported mental and physical health status. The MEPS asks each responded to rank their mental and physical health status on five-point Likert scales ranging from excellent to poor. I distinguish between those with poor, fair, or good health from those who report very good or excellent health.

[10] The greater than or equal to 400% category is the highest reported category in the data.

Health related attitudes: The MEPS asks respondents to state their agreement or disagreement with several statements to ascertain their health related behaviors and use of health services such as: “Health insurance is not worth the money it costs,” “I can overcome illness without help from a medically trained person,” “I am more likely to take risks than the average person,” and “I am healthy enough I really do not need health insurance.” If a respondent strongly agreed, agreed, or somewhat agreed with the statement I coded the response as agreement with the statement.

Health System Capacity: I captured measures of health care capacity by the number of primary care physicians and number of hospital beds per 1,000 county residents by using county measures from the AHRF.

Neighborhood Characteristics: I selected neighborhood variables from the 2010 Census. Neighborhood measures correspond to Census blocks. I make use of the proportion of Medicaid eligible and proportion of people in poverty to control for socioeconomic disadvantage in the neighborhood. Also, I use the proportion of whites and proportion of Hispanics in the neighborhood to capture the impact of the racial and ethnic composition of neighborhood on the access to care disparities.

Summary statistics by race and gender level are provided in Table 2.1. The summary statistics show that Hispanics are younger (about 42 percent to 46 percent of Hispanics fall in the age group of 18-34) compared to 30 percent of non-Hispanic whites. The marriage rate is lower for Hispanics, especially for Hispanic men (47 percent). Compared to non-Hispanic whites, Hispanics are less likely to be comfortable speaking English. For instance, about half of the Hispanic women (55 percent) and Hispanic men (52 percent) completed the interview in English. Citizenship rates among the Hispanic respondents are significantly lower as well,

as only about 45 percent of both Hispanic women and men are native born U.S. citizens, and about 20 percent of them got their citizenship through naturalization. The remaining Hispanics (about 40 percent) do not have U.S. citizenship.

Hispanic women are less likely to be employed and more likely to fall into the low income category compared with non-Hispanic whites. Furthermore, both Hispanic men and women are less likely to receive employment benefits. For instance, 62 percent of Hispanic women and 79 percent of Hispanic men are employed, and, conditional upon their employment, only 26 percent of both Hispanic women and men receive paid-leave time to see a provider. Likewise, about 50 percent of Hispanic women and 45 percent of Hispanic men fall in the low income category. By contrast, non-Hispanic whites, both men and women, are more likely to be employed (up to 81 percent), more likely to have higher income (up to 48 percent) and receive paid-leave time to see a provider (up to 39 percent). The gap for the high income category is statistically significant: up to 48 percent of non-Hispanic whites fall in high income category, compared to about 20 percent of both Hispanic women and men.

Similar to the pattern observed for income status, non-Hispanic whites are more educated than Hispanics. About 40 percent of Hispanics have less than a high school education, compared to 18 percent of non-Hispanic whites. There is very small difference across all the groups for high school or GED level education. But up to 34 percent of non-Hispanic whites have a more than a high school degree, compared with only 15 and 12 percent of Hispanic women and men, respectively.

A majority of non-Hispanic whites hold private health insurance most of the year. The mean duration of private health insurance coverage is about 8.5 months (0.70*12) for

non-Hispanic whites, compared to 5 months for Hispanics. The mean duration of being uninsured for Hispanic women is about 5 months, compared to 2 months for non-Hispanic white women. Similarly, the mean duration of being uninsured is more pronounced for Hispanic men at about 6 months, compared to 2.5 months for non-Hispanic white men. Women have longer public health insurance on average, particularly Hispanic women, who hold public health insurance an average of 2 months, followed by non-Hispanic women (1 month). The duration of holding both private and public health insurance is low (less than a month) across all groups.

Despite the large differences in health insurance coverage, reported physical and mental health is similar across the groups. Furthermore, 92 percent (or above) of all groups reported excellent or very good mental health status. There are clear differences in the health care attitudes between men and women. For instance, about 30 percent of Hispanic and non-Hispanic white men agree that insurance is not worth the cost and that they are more likely to take risks. In addition, 20 percent of Hispanic men and 15 percent of non-Hispanic white men agree that they do not need health insurance, compared to non-Hispanic white women (8 percent) and Hispanic women (17 percent). Non-Hispanic white men is the largest group (32 percent) to agree that they can overcome an illness without medical help, compared to non-Hispanic white women and Hispanics (up to 23 percent).

Hispanics are more likely to live in metropolitan areas. For instance, about 93 percent of Hispanics live in metropolitan areas, compared to 80 percent of non-Hispanic whites. Even though supply of primary care physicians per 1,000 area residents is similar across all groups, hospital beds per 1000 area residents for Hispanics is lower at about 2.8, compared to non-Hispanic whites at about 3.1. In terms of neighborhood characteristics, Hispanics tend to

live in neighborhoods with worse socioeconomic conditions than non-Hispanic whites. For instance, Hispanics live in neighborhoods with greater proportions of Medicaid eligible individuals (25 percent) and people in poverty (17 percent), compared to non-Hispanic whites (19 percent and 14 percent respectively). Furthermore, they are more likely to live in neighborhoods with a greater proportion of Hispanics.

2.7 Econometric Model

I investigate the factors that influence the "access to care" outcome variable using a Probit model. Expected probability for this analysis can be calculated by using the equation:

$$Accesstocare_i^* = ATC_i^* = x_i'\beta + \epsilon_i \qquad \epsilon_i \approx N(0, \sigma_1^2)$$

where ATC_i^* represents the unobserved latent variable for individual i, and $x_i$is a vector of factors such as individual characteristics, neighborhood characteristics, and health care supply capacity. The value of the β coefficients will determine the relationship between explanatory variables (x_i) and outcome variable (ATC_i^*) (i.e $\beta > 0$ means positive relationship, and β<0 negative relationship) and $\epsilon_i$is an error term. We can observe $ATC_i = 1$ if and only if $ATC_i > 0$, and $ATC_i = 0$ otherwise.The binary choice model is $P\{ATC_i = 1\} = F(x_i'\beta)$ where F a standard normal distribution. I report marginal effects in estimation tables.[11]

To identify whether access to care disparities exist between Hispanics and non-Hispanic whites and between genders in each group I take into account the nonlinearity of the probit regressions discussed above. Therefore, I use an alternative extension of the standard Blinder-Oaxaca decomposition for non-linear dependent variable models, decomposing differences in the first moment as suggested by Yun (2004). I also employ the

[11] Marginal effects derived from $f(x_i'\beta)\beta$ where $f(x_i'\beta)$ denotes the standard normal density function.

Fairlie decomposition method suggested by Fairlie (1999 and 2003) to perform a sensitivity analysis for the accuracy of decomposition results.

2.7.1 Non-Linear decompositions

Non-linear decomposition techniques are conceptually related to the standard decomposition technique introduced by Blinder (1973) and Oaxaca (1973). For a linear regression model, we can decompose the difference between the mean access to care for non-Hispanic whites and Hispanics as:

$$\overline{ATC}_w - \overline{ATC}_h = (\bar{X}_w - \bar{X}_h)\hat{\beta}_w - \bar{X}_h\,(\hat{\beta}_{w-}\hat{\beta}_h)$$

where $\hat{\beta}$s represent stored coefficients and $\bar{X}$s represent average values for each variable. The first term in brackets (explained portion or characteristics effect) represents differences in access to care due to differences in observed characteristics, such as education and income, while the second terms (unexplained portion or coefficients effect) represent how these explanatory variables differ in their influence on the access to care. The percent of explained part in equation 1 is sensitive to the choice of which coefficient vector is used ($\hat{\beta}_w$ or $\hat{\beta}_h$) (Holmes *et al.*, 2012). I choose whites as the reference group due to the assumption that white coefficients are supposed to be without discrimination (Krug and Nisic, 2011) and to quantify disparities as deprivation of Hispanics (Anne and Williams, 2009).

2.7.1.1 Fairlie Decomposition

To address the non-linearity, Fairlie (1999 and 2003) proposes an alternative expression for the standard Blinder-Oaxaca decomposition:

$$\overline{ATC}_w - \overline{ATC}_h = \left[\sum_{i=1}^{n^w} \frac{F\left(\bar{X}_i^w \hat{\beta}^w\right)}{n^w} - \sum_{i=1}^{n^h} \frac{F\left(\bar{X}_i^h \hat{\beta}^w\right)}{n^h}\right] + \left[\sum_{i=1}^{n^h} \frac{F\left(\bar{X}_i^h \hat{\beta}^w\right)}{n^h} - \sum_{i=1}^{n^h} \frac{F\left(\bar{X}_i^h \hat{\beta}^h\right)}{n^h}\right]$$

Fairlie uses this alternative expression for the decomposition because $\overline{ATC}$ is not necessarily equal $F(\bar{X}\hat{\beta})$. Here $\overline{ATC}$ represents the average probability of having access to care, F represents standard normal cumulative function, and $\hat{\beta}$ represents the stored coefficient estimates from probit regressions. Similar to the linear decomposition example above, I choose whites as the reference group and thus weight the first term with coefficient estimates for whites ($\hat{\beta}^{w}$) and the second term with the distributions of the explanatory variables for Hispanics (X_i^h). The first term in the equation represents the explained part, and the second term represents the unexplained part.

In particular, the detailed decomposition following Fairlie's (1999) approach can be found by a sequential replacement procedure:

$$\Delta(x_j) = \frac{1}{n^h}\sum_i \left[Pr\left(x_j^h \hat{\beta}_j + \sum_{k \neq j} (x_k^w \hat{\beta}_k) \right) - \Pr\left(x_j^w \hat{\beta}_j + \sum_{k \neq j} (x_k^w \hat{\beta}_k) \right) \right]$$

Here, the contribution of each explanatory variable can be quantified by replacing the value of the endowments in the reference group (i.e. whites) with the values from the comparison group (i.e. Hispanics), while holding all other variables constant (Williams, 2009; Holmes *et al.*, 2012). One problem with this approach arises due to inequality in sample size for reference and comparison groups. To address this one to one matching problem, Fairlie (2003) suggests randomly selecting a subsample from the reference group equal in the size to the comparison group, then ranking both reference group and comparison group by their predicted probabilities, matching those equally ranked respective groups, and then performing a sequential replacement procedure (i.e. replacing the value of the endowments in the reference group with the values from the comparison group) (Fairlie, 2003).

The final decomposition results are obtained from mean value estimates calculated from many replications with a large number of random subsamples of reference group. Here, I obtained the decomposition results from 1,000 randomly selected white subsamples. Further, this sequential replacement methodology suffers from path dependency; different ordering of explanatory variables can lead to different decomposition results (Yun, 2004). Stata offers an option to randomize the order of the explanatory variables in each replication to solve path dependency issue. Therefore, the Fairlie decomposition results reflect average results over all possible orderings of explanatory variables (Jann, 2006).

2.7.1.2 Decomposing Differences in the First Moment

Yun (2004) suggests a weight-based detailed decomposition for non-linear models.[12] First, Yun suggests decomposing the mean difference between the groups at the first moment as:

$$\overline{ATC}_w - \overline{ATC}_h = \left[\overline{F(X_w\beta_w)} - \overline{F(X_h\beta_w)}\right] + \left[\overline{F(X_h\beta_w)} - \overline{F(X_h\beta_h)}\right]$$

The decomposition equation above provides aggregate measures of the characteristics and coefficient effect. To find the detailed decomposition, I follow Yun's (2004) two step approximation methods. This methodology allows me to calculate the proper weights necessary to factor out the contribution of each explanatory variable from the aggregate decomposition (see appendix B). By evaluating the standard normal function $\overline{F(X\beta)}$ at the mean values (i.e$\overline{F(X\beta)} \approx F(\bar{X}\beta)$) and using a first order Taylor expansion series to approximate the characteristics effects and the coefficient effects around the $\bar{X}_w\beta_w$ and $\bar{X}_h\beta_h$, respectively, the final decomposition becomes:

[12] The only requirement for using the decomposition technique at the first moment is that the function should be once differentiable (Yun, 2005).

$$\overline{ATC}_w - \overline{ATC}_h = \sum_{i=1}^{i=k} W_{\Delta x}^i \left[\overline{F(X_w\beta_w)} - \overline{F(X_h\beta_w)}\right] + \sum_{i=1}^{i=k} W_{\Delta\beta}^i \left[\overline{F(X_h\beta_w)} - \overline{F(X_h\beta_h)}\right]$$

where $W_{\Delta x}^i = \frac{(\bar{X}_w^i - \bar{X}_h^i)\hat{\beta}_w^i}{(\bar{X}_w - \bar{X}_h)\hat{\beta}_w}$; $W_{\Delta\beta}^i = \frac{(\hat{\beta}_w^i - \hat{\beta}_h^i)\bar{X}_h^i}{(\hat{\beta}_w - \hat{\beta}_h)\bar{X}_h}$; and $\sum_{i=1}^{i=k} W_{\Delta x}^i = \sum_{i=1}^{i=k} W_{\Delta\beta}^i = 1$.

Similar to the standard linear decomposition, the contribution of the *i*th explanatory variable to the aggregate characteristics and coefficient effects can then be derived using the mean values of characteristics $(\bar{X}_w^1, \bar{X}_h^1, \dots, \bar{X}_w^k, \bar{X}_h^k)$ and their estimated coefficients $(\hat{\beta}_w^1, \hat{\beta}_h^1, \dots, \hat{\beta}_w^k, \hat{\beta}_h^k)$. For example, the weights of the first explanatory variable for the respective characteristics effect and coefficient effects are:

$$W_{\Delta x}^1 = \frac{(\bar{X}_w^1 - \bar{X}_h^1)\hat{\beta}_w^1}{(\bar{X}_w^1 - \bar{X}_h^1)\hat{\beta}_w^1 + (\bar{X}_w^2 - \bar{X}_h^2)\hat{\beta}_w^2 + \cdots + (\bar{X}_w^k - \bar{X}_h^k)\hat{\beta}_w^k}$$

$$W_{\Delta\beta}^1 = \frac{(\hat{\beta}_w^1 - \hat{\beta}_h^1)\bar{X}_h^1}{(\hat{\beta}_w^1 - \hat{\beta}_h^1)\bar{X}_h^1 + (\hat{\beta}_w^2 - \hat{\beta}_h^2)\bar{X}_h^2 + \cdots + (\hat{\beta}_w^k - \hat{\beta}_h^k)\bar{X}_h^k}$$

In sum, I calculate the detailed decomposition in three steps. To find the aggregate characteristics effect I perform two Probit regressions. In the first regression I use characteristics for whites (X_w) and estimate coefficients for whites (β_w) and predicted probability for whites to have a regular source of care. In the second estimation I run a second regression by replacing the white characteristics (X_w) with Hispanic characteristics (X_h). This second estimation gives the probability of Hispanics having a regular source of care if they had the same characteristics as whites. Taking the difference in predicted probabilities gives the disparity between whites and Hispanics due to differences in their characteristics (i.e. characteristics effect or explained part). Finding the aggregate coefficient

effects is similar and gives information on how differently Hispanics would behave if their coefficients are changed to white coefficients.

Next, I calculate the proper weights for each explanatory variable by using the mean value of characteristics and their estimated coefficients as explained above. Finally I multiply the weights with aggregate characteristics effect and coefficient effect to find the contribution of each variable to the characteristics effect and coefficient effects. I reported decomposition results in tables 2.3a, 2.4a, and 2.5a. The first row of each table shows the magnitude of disparities between identified groups and how much of the disparities are explained by characteristics effect and coefficient effect. The second row of each tables shows the detailed decomposition.

The Non-linear decomposition method proposed by Yun (2004) has some advantages over the decomposition method proposed by Fairlie (1999 and 2005). First, weights can easily be calculated using the mean values of characteristics and estimated coefficients. Second, the linearization process overcomes the critiques of sequential replacement, such as path dependency, and the one to one matching process mentioned above (Gradin, 2012). Therefore, I calculated disparity estimates using the weight-based detailed decomposition technique suggested by Yun (2004). I also provide the disparity estimates from Fairlie's decomposition method for sensitivity analysis purposes.

2.8 Results

2.8.1 Probit Model Estimation Results

Table 2.2 presents the marginal effects for Hispanics and non-Hispanic whites for having a regular source of care. The probability of having access to health care increases as respondents get older, independent of ethnicity and gender. In particular, being in oldest

cohort increases probability having a regular source of care up to 13 percentage points for Hispanics, compared to that of 18.4 percentage points for non-Hispanic whites. The cohort of 35-49 has relatively lower access to care than the oldest cohort; however the probability of having a regular source of care is 6.4 percentage points to 9.3 percentage points higher than youngest cohort across the all groups. Consistent with other studies (Zuvekas and Taliaferro, 2003), being married increases the probability of having a regular source of care for all groups, except for Hispanic women. Particularly, Hispanics and non-Hispanic white married men are 4.2 percentage points to 6.0 percentage points more likely to have a regular source of care, compared to never married men.

English proficiency has the only significant impact on Hispanic men's access to care. Hispanic men who completed the interview using only English are 3.7 percentage points more likely to have a regular source of care, compared to those completed the interview in just Spanish or both Spanish and English. Furthermore, citizenship status improves having a regular source of care across all groups. Those who were born in the U.S. (and U.S. citizens) are 4.1 percentage points to 14.4 percentage points more likely to have a regular source of care, compared to those who are not citizens. Naturalized Hispanic women are 3.8 percentage points more likely to have a regular source of care than non-citizen Hispanic women. However, naturalized Hispanic men's access to care is not significantly different than those who are not citizens.

Across all groups, except for Hispanic men, being in the middle income category increases the probability of having a regular source of care, compared to being in the low income category. For instance, middle income Hispanic women are 5.2 percentage points more likely to have a regular source of care than their corresponding low income cohort.

However, being in middle income category does not improve Hispanic men's access to care, and they do not have statistically significant access to care compared to Hispanic men with lower income. Being in higher income category increases the probability of having a regular source of care across all groups (5.1 percentage points to 5.6 percentage points). Furthermore, educational level does not have statistically significant impact on access to care for non-Hispanic whites. Interestingly, more than high school education only improves Hispanic men's access to care (8.8 percentage points).

Paid-leave is only important for men. Hispanic men and non-Hispanic white men who do not have paid leave time have 5.9 percentage points to 7.4 percentage points lower probability of having a regular source of care, compared to non-working men. For women, benefit structure is not driving their access to health care behavior.

Insurance coverage type and duration of insurance has a large and positive impact on having a usual source of care for both non-Hispanic whites and Hispanics. For instance, increasing the duration of private insurance by 6 months (which corresponds to a standard deviation of 0.5)[13] increases the probability of having a regular source of care by 13.5 percentage points to 14.5 percentage points for Hispanics and 11.0 percentage points to 12.5 percentage points for non-Hispanic whites, compared to being uninsured for 6 months. Similarly, increasing the duration of public insurance by 6 months increases the probability of having a regular source of care for Hispanics (up to 18.5 percentage points) and non-Hispanic whites (up to 17.5 percentage points).

Across all groups, those who report excellent or very good physical health are also less likely (4.2 percentage points to 7.2 percentage points) to have a regular source of care. Self-reported mental health, however, matters only for Hispanic women. Hispanic women

[13] Standard deviation of 0.5 is chosen to make interpretations easier.

who reported having a better mental health status are 5.7 percentage points less likely to have a regular source of care, compared to those who reported a worse mental health status.

Across all groups, a person agreeing that "he or she can overcome an illness without medical help or not" has negative impact on having a regular source of care. Agreement on overcoming illness without medical help reduces the probability of having a regular source of care up to 5.5 percentage points for Non-Hispanic whites and up to 7.6 percentage points for Hispanics, compared to disagreement of the corresponding cohort. Similarly, agreement on "healthy-do not need insurance" lowers the probability of having a regular source of care, especially for non-Hispanic whites (up to 8.9 percentage points). However, agreement on whether "health insurance is not worth the cost" and agreement on "more likely taking risk" does not have significant impact on having a regular source of care, with the exception of one case; those non-Hispanic whites who agree that they are more likely to take risks are 2.7 percentage points less likely to have a regular source of care.

Furthermore, the number of primary care physicians reduces the non-Hispanic white men's access to care by 1.3 percentage points (0.048*0.293),[14] and living in a neighborhood with greater proportion of Hispanic population reduces both non-Hispanic white men and women's access to care by 4.4 percentage points (0.212*0.110). In contrast, living in a neighborhood with greater proportion of Medicaid eligible individuals improves Hispanic men's access to care by 4.7 (0.469*0.110) percentage points.

2.8.2 Decomposition Results

Table 3a presents the results of the non-linear decomposition analysis between non-Hispanic whites and Hispanics. The first row of the table shows the magnitude of disparities between identified groups and how much of the disparities are explained by observed

[14] Calculation is based on one standard deviation above the mean.

characteristics and unobserved characteristics. In contrast to the previous literature, I find that observed characteristics explain all of the disparity in access to care. Differences in observed characteristics explain 136 percent (0.269/0.197) of the disparities in access to care. This finding indicates that if both groups had the same observed characteristics, then Hispanics would have more access to care.

Table 2.3a breaks down the contribution of explanatory variables to the disparities in having a regular source of care. Here, I grouped insurance status, citizenship status, age, income, attitudes and beliefs, health care supply capacity, and community characteristics into one category for each to give their total effects. Table 2.3b shows the detailed decompositions for explained characteristics where I extracted individual contributors from grouped characteristics.

I find that differences in U.S. citizenship, English proficiency, and health insurance coverage are the most significant and sizable observable characteristics that explain the disparities in access to care between non-Hispanic whites and Hispanics. Differences in health insurance explain 32 percent of the disparities in access to care. This finding is consistent with those reported by Zuvekas and Taliaferro (2003) and Kirby, Taliaferro, and Zuvekas (2006). Furthermore, I find that the differences in language proficiency account for 26 percent of the disparities in access to care. However, Kirby and his colleagues (2006), by using the 2000 and 2001 MEPS, find that language proficiency has little impact (3 percent) on access to care disparities between non-Hispanic whites and Hispanics. This finding may suggest that the impact of language proficiency on disparities has grown over the last decade. Furthermore, differences in being a U.S. citizen or U.S.-born accounts for 28.4 of the disparities in access to care.

In regards to impact of external barriers on access to care disparities, consistent with previous research, I find that health care supply capacity has no impact, whereas community characteristics have a large impact on access to care disparities. For instance, differences in racial and ethnic composition of neighborhood account for 30 percent of the disparities in access to care. Kirby and his colleagues (2006) found the impact of this measure at 20 percent.

Other factors emphasized in the literature, such as age and income, have relatively little impact in explaining the disparities in access to care. For instance, I find that the differences in age structure explain about 15 percent, and differences in income explain 8.6 percent of the disparities in access to care. However, Hargraves and Handley (2003), using the 1998-1999 Community Tracking Survey, find that the impact of differences in income on Hispanic-white access to care disparities is larger (20 percent).

2.8.3 Decomposition Results between Same Gender and Different Ethnicity

Table 2.4a presents the results of separate decomposition analyses for women and men. Differences in observed characteristics explain all of the disparities in access to care for both men and women, showing that 113 percent (0.236/0.246) of the differences in access to care for men and 179 percent (0.269/0.150) for women are explained by differences in observed characteristics.

Table 2.4a breaks down the contribution of explanatory variables to the disparities in having a regular source of care. Here, I reported the contribution of insurance status, citizenship status, and language individually because their impacts on access to care disparities are large. Table 2.4b shows the detailed decompositions for explained characteristics where I extracted individual contributors from grouped characteristics.

Differences in being a citizen and being born in the U.S. and duration of holding private health insurance are the largest observed characteristics explaining the disparities in access to care for women and men, followed by differences in English proficiency. Being a citizen and being born in the U.S. explains the 49.3 percent of the disparities between women and 23.7 percent of the disparities between men. Furthermore, the contribution of differences in English proficiency to the disparities is larger for women, explaining up to 40 percent of the disparities. Furthermore, differences in the duration of holding private insurance explain 45.3 percent of the difference in having a regular source of care between women. This percentage is 32.6 percent for men. In contrast, providing benefits such as naturalization and public health insurance lowers the disparities between non-Hispanic whites and Hispanics, especially between women. Holding public insurance and the naturalization process together reduces the disparities by 21.3 percent for women and by 6.4 percent for men.

Other personal characteristics such as income and age have similar impact on the disparities for both groups. Being in the older cohort explains about 15 percent, and differences in income explain about 10 percent of the disparities for both groups. By contrast, measures of health care attitudes and beliefs explain only 2 percent of the gap between women. Other personal characteristics such as differences in education, marital status, and region together explain only 7.3 percent of the disparities for women and less than 1 percent for men.

2.8.4 Decomposition Results between Same Ethnicity and Different Gender

Table 2.5a presents the results of separate decomposition analyses for Non-Hispanic whites and Hispanics. Differences in observed characteristics account for much less of the disparities between the genders of non-Hispanic whites and between the genders of

Hispanics. For instance, differences in observed characteristics explain only 30 percent (0.027/0.088) of the disparities between non-Hispanic white women and men. Similarly observed characteristics explain 28 percent (0.049/0.174) of the disparities between Hispanic women and men.

Attitudes and beliefs and insurance status (particularly public insurance) are the largest observed characteristics explaining the disparities between the genders. For instance, differences in measures of health care attitudes and beliefs explain 18 percent of the disparities between non-Hispanic white women and men and 5.1 percent of the access to care gap between Hispanic women and men. This finding is important because it shows how women's attitudes and beliefs towards healthcare are different than those of men. Furthermore, difference in duration of holding public insurance also contributes to the gap between non-Hispanic white women and men as much as 10 percent. The contribution of difference in duration of holding public insurance to the gap between Hispanic women and men is 15 percent.

Unexplained differences account for about two-thirds of the women-men disparities in both ethnicities. It is harder to trace back the disparities that are due to the unexplained part of the decomposition. Differences in sociocultural norms, values, and social networks all may have a different impact on women than men. In particular, a large estimated constant is responsible for the disparities between Hispanic men and women (see Table 2.5b). This large constant represents how Hispanic women systematically have a more regular source of care than Hispanic men.

2.9 Sensitivity Analysis

I performed a robustness test to detect whether my results are sensitive to the decomposition method I employed and to the specification of weights. For instance, the decomposition results I reported are calculated taking whites as reference group. Even if I calculate the decomposition results with pooled estimates of coefficients, I still find the differences in observed characteristics explain 104 percent (0.205/0.197) of disparities. Furthermore, my main results are not sensitive to the decomposition method I employed. Table 2.3a presents Fairlie's decomposition method results between non-Hispanic whites and Hispanics. Similarly, differences in observed characteristics explain all of the disparities. However, the impact of differences in language proficiency (35 percent) and insurance status (40 percent) are larger, whereas differences in citizenship status (20 percent) and community characteristics (20 percent) are lower, compared to decomposition method results suggested by Su Yun. Even though the magnitude of contributions of those variables is slightly different, they still remained the most significant and sizable contributors to the access to care disparities between non-Hispanic whites and Hispanics.

I also performed a sensitivity analysis to detect whether my results are sensitive to the coding of variables. For instance, I considered those who completed the interview with Some Spanish as proficient in English, and I included those who reported Emergency room as a regular source in the analysis, and my results were not sensitive to the modifications.

Finally, this paper builds upon Kirby, Taliaferro, and Zuvekas (2006) with the added modifications mentioned previously: inclusion of U.S. residency status, duration of health insurance, employment benefit variables. I performed a robustness check by using the MEPS 2000 and 2001, and the variables that Kirby and his colleagues (2006) have used to estimate the disparities between non-Hispanic whites and Hispanics (i.e. I didn't use citizenship status

and being born in U.S.). I was able to replicate the findings in Kirby, Taliaferro, and Zuvekas (2006) with Yun's (2004) non-linear decomposition technique. Replicating the baseline study findings gives me confidence in concluding that the nature of disparities has changed over time and observed characteristics have a better explanatory power in explaining access to care disparities.

2.10 Discussion and Conclusions

There is a general consensus in health care disparities literature that access to care disparities between non-Hispanic whites and Hispanics exist. However, previous studies were not able to fully explain factors associated with access to care disparities, which created challenges to providing a clear and articulated strategy to eliminate access to care disparities. This study aimed to update the literature on access to care disparities between non-Hispanic whites and Hispanics in four ways: (1) by using the most current Medical Expenditure Panel Surveys; (2) with a rich set of variables such as health care supply capacity, community characteristics, and citizenship status; (3) with a gender perspective; and (4) by adapting non-linear decomposition techniques.

I find that there is heterogeneity between Hispanics and non-Hispanic whites in terms of their access to care level, health insurance coverage, and socioeconomic and demographic characteristics such as age, education, and income. Hispanics, in particular Hispanic men, have low levels of access to care and longer duration of lack of insurance, compared to non-Hispanic whites. Furthermore, they are more likely to be younger, poorer, and have lower educational level. All these factors may have a substantial impact on health care access barriers. As with other studies (Law and VanDerslice, 2011; Bustamante *et al.*, 2009), I find

that age, income, marital status, and citizenship status improves one's access to health care independent of gender and racial and ethnic background.

Perhaps the most important finding of this paper is that the nature of the disparities in access to care has changed, and observed characteristics explain all of the disparities between non-Hispanic whites and Hispanics (and between the same genders). I find that differences in duration of health insurance coverage, English proficiency, citizenship status, and racial and ethnic composition of neighborhood are the most relevant observable characteristics that explain the disparities in access to care. All of these observed characteristics are indeed tied to each other, and addressing only one (i.e. health insurance coverage) will not be sufficient to eliminate racial and ethnic disparities in access to care.

I find the impact of English proficiency on non-Hispanic white and Hispanic access to care disparities is large (26 percent). However, Kirby, Taliaferro, and Zuvekas (2006), using the 2000-2001 MEPS and variables similar to the ones used in this study, found that the impact of language proficiency explains only three percent of the disparities. Therefore, the impact of language proficiency on access to care disparities has grown. The patient protection and Affordable Health Care Act (ACA) mandates health insurance coverage to all U.S. citizens, naturalized citizens, and lawfully present immigrants. Therefore, individuals who have limited English proficiency will be more relevant in health care settings, and the need for language services in all areas of healthcare will increase (Cyracom, 2013). The ACA, building upon existing provisions,[15] requires insurers and health care institutions to provide written translations and interpretation services for limited proficiency individuals (McGowan, 2013). However, providing language assistance may not be enough to ensure

[15] There have been efforts to address the effects of limited English proficiency such as culturally and linguistically appropriate services at health care organizations and mandated interpreter services (Title VI of the Civil rights act of 1964) (Derose, Secarce, and Lurie, 2007)

their access to health care. For instance, efforts are needed to help individuals with limited English proficiency become aware of their legal rights, increase provider's sensitivity to using trained medical interpreters, and invest in a trained medical interpreter workforce (Chen, Youdelman, and Brooks, 2007). In addition, increasing the number of bilingual and bicultural health care workers may be necessary to reduce the access to care barriers for individuals with limited English proficiency (Lee and Choi, 2009).

Health insurance reduces the cost of medical services (i.e. reduces out-of-pocket costs) and is expected to increase the demand for health care. My findings confirm those of previous studies, having health insurance is essential in reducing racial and ethnic disparities in health care. For instance, the variation in the duration of holding private health insurance accounts for 30 percent of the disparities between non-Hispanic whites and Hispanics and up to 45 percent of the disparities between women of different ethnicities. Historically, Hispanics are more likely to be uninsured or underinsured than non-Hispanic whites. As noted before, the causes of low health insurance for Hispanics are complex and in part tied to English proficiency, employment characteristics and low take-up rates, citizenship status, and eligibility requirements for public insurance programs (Escarce and Kaper, 2006). The ACA aims to address these barriers by making health insurance more affordable through insurance Marketplaces, expanding Medicaid eligibility, and giving financial incentives to both middle income families and small businesses.[16] However, the extent to which the ACA expands the coverage among Hispanics depends on whether Hispanics take the advantage of enrolling in

[16] For instance, Medicaid eligibility will be expanded to those families with incomes up to 138% of the poverty level (only in 26 participating states). Middle income families will receive tax credits, and businesses with more than 50 employees are required to provide health insurance coverage. Small businesses with less than 25 employees will receive a tax credit if they choose to prove health insurance. Furthermore, those individuals who don't have access to affordable coverage will be able to buy insurance through new health insurance exchange marketplaces for affordable health plans (Kaiser, 2013).

insurance Marketplaces or not. Low levels of health insurance literacy, cultural factors, lack of information about the ACA, lack of internet access, and fears of giving information regarding immigration status are possible obstacles that may slow down or prevent Hispanic's enrollment through insurance Marketplaces (Radelat, 2014; Blavin *et al.*, 2014).

The findings also suggest that providing public health insurance and gaining U.S. citizenship offset the access to care disparities between non-Hispanic whites and Hispanics, especially between women (21 percent). Gaining U.S. citizenship through naturalization may be capturing both the time lived in U.S. and eligibility for public insurance programs. Therefore, public health insurance programs such as Medicaid are important policy tools to improve access to care, especially for low income Hispanic women. In this regard, Medicaid eligibility expansion has an important potential to curb access to care disparities. However, requirements in immigration status may affect the expectations. For instance, legal immigrants those have been in U.S. at least five years and have low income are eligible to enroll Medicaid. Furthermore, with the ACA, those who are in U.S. for less than five years can buy insurance through Marketplace. However, those without legal immigration status can participate in neither of them (Ku and Matani, 2013). Therefore, access to care barriers will remain to those undocumented immigrants (about 11 million people) or families with mixed immigration status[17] (The Common Wealth Fund, 2013).

Furthermore, I find that community characteristics such as neighborhood racial and ethnic composition are associated with health care seeking behavior. For instance, it explains 30 percent of the disparities between non-Hispanic whites and Hispanics. What exactly the racial and ethnic composition of neighborhood is capturing deserves further examination. Living in a neighborhood with a greater proportion of Hispanics may be preventing

[17] Mixed family term is used to refer families with U.S. born children.

intergroup relations with non-Hispanic whites and African Americans. Less frequent contact with other groups may be reducing quality and quantity of social networking, especially regarding the health care system. In addition, recent immigrants may prefer to live in Hispanic segregated areas, which may motivate them to retain their cultural beliefs and behaviors regarding the health care system. All of these are unmeasured personal characteristics that may be captured through examining the racial and ethnic composition of neighborhoods.

Finally, I find that introducing a gender variable is important. Combining both genders in decomposition confounds the fact that Hispanic men are by far the most disadvantaged group in terms of access to care, and the magnitude of how their access to care behavior is influenced by observed characteristics is lower than those of women. For instance, this finding implies that relaxing access to care barriers such as having health insurance or the naturalization process improves Hispanic women's access to care more than for Hispanic men. Furthermore, the disparity between Hispanic women and Hispanic men is large (17.4 percent), and differences in observed characteristics explain only 30 percent of the disparities. Some of the disparities can be traced back to the differences between their attitudes and beliefs regarding health care and their participation in public health insurance. However, the large estimated constant suggest that Hispanic women are systematically having a more regular source of care than Hispanic men. Policymakers may consider complimentary policy approaches to engage Hispanic men to access to health care. Providing paid leave to see a provider and lowering the opportunity cost of utilization health care services may help. More importantly, culturally competent care and improved patient-provider relationships may be more important for Hispanic men. Overall, more studies

should be done to assess Hispanic men's access to care behaviors. Otherwise, we may not see the ACA be effectively translated into better access to care for Hispanic men.

Table 2.1: Descriptive statistics

		White, non-Hispanic		Hispanic	
	All	**Women**	**Men**	**Women**	**Men**
Sample Size	35,797	11,565	10,957	6,907	6,368
Access to Care Variable					
Have a regular source of care	74.4	82.2	73.6**	67.4**	50.0**
Age range					
18-34	33.3	30.0	31.7**	42.7**	46.2**
35-49	32.1	31.8	31.1	35.6**	34.8*
50-64	34.6	38.2	37.2*	21.8**	19.1**
Marital Status and Family Size					
Married	56.1	58.2	57.2*	51.6**	46.5**
Widowed/Divorced/Separated	16.1	18.9	14.0**	18.0	11.4**
Never married	27.7	22.9	28.8**	30.5**	42.1**
Family Size	2.90	2.78	2.74	3.59**	3.46**
	(1.511)	(1.382)	(1.412)	(1.755)	(1.867)
Language and Citizenship					
Interview in English only	91.5	99.8	99.7	55.4**	52.0**
Citizen, U.S. born	86.8	95.8	96.0	45.0**	43.8**
Citizen, non-U.S. Born (naturalized)	5.5	2.7	2.5	20.1**	17.0**
Noncitizen	7.8	1.5	1.5	34.9**	39.2**
Employment					
Employed	75.4	71.9	80.8**	62.3**	78.6**
Paid-leave time to see a provider	36.0	37.7	38.5	26.5**	26.5**
Not-paid-leave time to see a provider	37.1	32.5	39.7**	33.5	48.8**
Unemployed or not in the labor force	24.6	28.1	19.2**	37.7 **	21.4**
Income Status					
Low income	27.2	24.4	21.4**	49.8**	44.3**
Middle income	30.8	30.5	30.3	30.9	34.1**
Higher income	42.1	45.1	48.4**	19.4**	21.6
Education					
Less than high school	21.9	18.0	18.2	38.6**	40.5**
High school	48.5	48.1	49.8*	46.0*	46.9
More than high school	29.6	34.0	32.0**	15.4**	12.6**
Region and MSA status					
Northeast	17.7	18.6	18.8	14.1*	12.8**
Midwest	23.2	26.4	26.5	7.9**	8.4**
South	35.1	34.8	34.6	37.1	36.6
West	24.0	20.2	20.2	40.9**	42.2**
MSA	83.0	80.9	80.7	93.1**	93.0**
Insurance status (proportion of year with coverage)					
Private insurance	0.660	0.715	0.709	0.426**	0.416**
	(0.409)	(0.344)	(0.337)	(0.637)	(0.582)
Public insurance	0.096	0.104	0.074**	0.168**	0.096**
	(0.253)	(0.231)	(0.195)	(0.471)	(0.340)
Both private and public insurance	0.024	0.028	0.025	0.017**	0.013**
	(0.127)	(0.120)	(0.111)	(0.159)	(0.126)
Uninsured	0.219	0.153	0.192**	0.389**	0.475**
	(0.350)	(0.265)	(0.287)	(0.612)	(0.583)
Perceived Health Status					
Excellent or very good physical health	88.7	88.8	89.7*	84.3**	88.2
Excellent or very good mental health	93.0	92.2	93.4*	93.1	94.5**
Health care attitudes and beliefs					
Insurance not worth the money	27.0	23.6	29.8**	26.2*	30.6**
Can overcome illness without medical help	26.0	22.7	31.9**	16.8**	23.1
Healthy-no need health insurance	12.6	8.3	15.2**	13.0**	20.1**
More likely to take risks	23.5	14.6	31.5**	20.4**	30.3**

Table 2.1: Descriptive statistics (cont.)

		White, non-Hispanic		Hispanics	
	All	**Women**	**Men**	**Women**	**Men**
Health Care Supply Capacity					
Physician per 1000 county resident	0.72	0.73	0.73	0.70	0.70
	(0.283)	(0.293)	(0.294)	(2.376)	(2.278)
Hospital beds per 1000 county resident	3.08	3.11	3.16	2.83**	2.76**
	(2.028)	(2.110)	(2.169)	(1.433)	(0.134)
Neighborhood Characteristics (proportion of neighborhood)					
Proportion of Medicaid eligible	0.203	0.191	0.193	0.248**	0.250**
	(0.085)	(0.075)	(0.075)	(0.105)	(0.104)
Proportion of people in poverty	0.151	0.145	0.147	0.175**	0.172**
	(0.051)	(0.048)	(0.048)	(0.058)	(0.057)
Proportion White	0.757				0.656
		0.780	0.778	0.658**	**
	(0.152)	(0.144)	(0.145)	(0.146)	(0.145)
Proportion Hispanic	0.151	0.111	0.113	0.339**	0.332**
	(0.162)	(0.113)	(0.116)	(0.213)	
Years					
Year 2009	34.4	34.8	34.6	32.8	33.7
Year 2010	31.6	31.4	31.7	32.1	31.9
Year 2011	33.9	33.8	33.8	35.1	34.4

Source: Authors' calculations from the Medical Expenditure Panel Survey, 2009, 2010 and 2011.
Notes: Standard errors in parentheses. Standard errors are only reported for continues measures.
Weighted Estimates are reported.
** Statistically significantly different from non-Hispanic white women at the 0.05 level.
* Statistically significantly different from non-Hispanic white women at the 0.1 level.
P-values are based on chi-square test for categorical variables and student's t-test for continuous variables.

Table 2.2: Determinants of Having a Regular Source of Care, by Gender and Hispanic Origin

	White, non-Hispanic		Hispanic	
	Women	**Men**	**Women**	**Men**
Age				
Age 35-49	0.077**	0.093**	0.064**	0.067**
	(0.013)	(0.014)	(0.011)	(0.021)
Age 50-64	0.131**	0.184**	0.101**	0.132**
	(0.013)	(0.014)	(0.017)	(0.023)
Marital Status and Family Size				
Married	0.015	0.042**	0.032**	0.060**
	(0.014)	(0.014)	(0.014)	(0.020)
Widowed/Divorced/Separated	-0.016	-0.044*	0.006	-0.019
	(0.017)	(0.023)	(0.019)	(0.037)
Family size	0.002	0.012**	-0.003	-0.004
	(0.004)	(0.005)	(0.004)	(0.004)
Language and Residency				
Interview in English	0.149	0.101	-0.005	0.037**
	(0.090)	(0.088)	(0.016)	(0.018)
Citizen, U.S. born	0.144**	0.108**	0.041**	0.068**
	(0.037)	(0.046)	(0.016)	(0.024)
Citizen, naturalized	0.083*	0.055	0.038**	0.018
	(0.047)	(0.054)	(0.018)	(0.021)
Income status				
Middle income	0.029**	0.037**	0.052**	0.004
	(0.013)	(0.017)	(0.015)	(0.019)
High income	0.051**	0.078**	0.068**	0.088**
	(0.014)	(0.015)	(0.023)	(0.024)
Education				
High school or GED	0.007	-0.014	-0.009	0.031
	(0.017)	(0.016)	(0.015)	(0.020)
More than high school	0.022	-0.009	-0.010	0.088**
	(0.022)	(0.020)	(0.018)	(0.027)
Employment				
Paid-leave time to see a provider	0.015	-0.015*	-0.003	-0.011
	(0.015)	(0.016)	(0.020)	(0.029)
Not-paid-leave time to see a provider	0.001	-0.059**	-0.023*	-0.074**
	(0.013)	(0.014)	(0.013)	(0.019)
Region				
Northeast	0.054**	0.071**	0.032	0.022
	(0.025)	(0.023)	(0.030)	(0.033)
Midwest	0.014	0.027	0.014	0.035
	(0.023)	(0.025)	(0.029)	(0.040)
South	-0.066**	-0.045**	-0.080**	-0.024
	(0.023)	(0.023)	(0.027)	(0.040)
MSA	-0.023	-0.024	-0.037	-0.011
	(0.017)	(0.021)	(0.054)	(0.038)
Health Insurance Coverage				
Private insurance	0.229**	0.259**	0.250**	0.271**
	(0.017)	(0.017)	(0.020)	(0.025)
Public insurance	0.241**	0.356**	0.240**	0.347**
	(0.022)	(0.025)	(0.021)	(0.033)
Both private and public insurance	0.270**	0.340**	0.320**	0.603**
	(0.036)	(0.048)	(0.058)	(0.131)
Perceived Health Status				
Excellent or very good physical health	-0.072**	-0.069**	-0.042**	-0.049**
	(0.019)	(0.023)	(0.017)	(0.023)
Excellent or very good mental health	0.013	0.013	-0.057**	-0.033
	(0.020)	(0.025)	(0.026)	(0.031)

Table 2.2: Determinants of Having a Regular Source of Care, by Gender and Hispanic Origin (cont.)

	White, non-Hispanic		Hispanic	
	Women	**Men**	**Women**	**Men**
Perceptions about Health/Health Care				
Healthy- do not need insurance	-0.078**	-0.089**	-0.044**	-0.033*
	(0.017)	(0.014)	(0.018)	(0.020)
More likely to take risks	-0.027**	-0.002	-0.005	-0.003
	(0.012)	(0.011)	(0.013)	(0.016)
Insurance not worth the money	-0.020	-0.016	-0.018	-0.009
	(0.013)	(0.012)	(0.014)	(0.018)
Can overcome illness without medical help	-0.055**	-0.045**	-0.035**	-0.076**
	(0.013)	(0.012)	(0.018)	(0.020)
Health Care Supply Capacity				
Physicians per 1000 area residents	-0.007	-0.048**	-0.028	0.029
	(0.026)	(0.024)	(0.042)	(0.049)
Number of hospital beds per 1,000 area residents	0.001	0.003	0.008	-0.001
	(0.004)	(0.004)	(0.009)	(0.006)
Neighborhood Characteristics (proportions of neighborhood)				
Medicaid eligible	0.225	0.110	0.008	0.469**
	(0.154)	(0.142)	(0.135)	(0.162)
People in poverty	-0.214	-0.557**	-0.245	-0.374
	(0.233)	(0.248)	(0.296)	(0.293)
Hispanics	-0.180**	-0.212**	-0.068	-0.049
	(0.063)	(0.073)	(0.065)	(0.062)
White	0.076	-0.047	0.079	0.111
	(0.067)	(0.063)	(0.078)	(0.081)
Observations	103,626	103,347	101,253	101,395

Source: Authors' calculations from the Medical Expenditure Panel Survey, 2009, 2010 and 2011.
Notes: Standard errors in parentheses.
** Statistically significant at the 0.05 level and 0.01 level.
* Statistically significant at the 0.1 level
Adjusted for year fixed effects

Table 2.3a: Non-Linear Decompositions: non-Hispanic white and Hispanics

	Have a regular source of care			
	Su Yun		Fairlie	
Hispanic's Access to care	0.583		0.566	
Non-Hispanics Access to Care	0.786		0.768	
Total Disparity	-0.197		- 0.202	
Difference due to observed characteristics	-0.269		-0.282	
Difference due to unobserved characteristics	0.072		0.080	
	points	**%**	**points**	**%**
Internal Factors				
Interviewed in English	-0.051	26.0	-0.070	34.6
Citizenship status	-0.056	28.4	-0.041	20.0
Insurance Status	-0.064	32.5	-0.080	40.0
Age	-0.029	14.7	-0.022	11.0
Income	-0.017	8.6	-0.019	9.4
Attitudes and Beliefs	0.000	0.0	0.001	0.0
Other Personal Characteristics	-0.004	2.2	-0.010	5.0
External Factors				
Healthcare Supply Capacity	0.000	0.0	0.000	0.0
Community Characteristics	-0.048	30.0	-0.041	20.0

Table 2.4a: Non-Linear Decomposition: Same gender and different ethnicity

	Have a regular source of care			
	Women		**Men**	
Hispanic's Access to care	0.680		0.506	
Non-Hispanics Access to Care	0.830		0.742	
Total Disparity	-0.150		-0.236	
Difference due to observed characteristics	-0.269		-0.269	
Difference due to unobserved characteristics	0.119		0.032	
	points	**%**	**points**	**%**
Internal Factors				
Citizenship Status and Language				
Interviewed in English	-0.060	40.0	-0.044	18.6
Citizen, U.S. born	-0.074	49.3	-0.056	23.7
Citizen, naturalized	0.015	10.0	0.008	3.4
Insurance Status				
Private insurance	-0.068	45.3	-0.077	32.6
Public insurance	0.017	11.3	0.008	3.4
Both private and public insurance	-0.003	2.0	-0.004	1.7
Age	-0.022	14.6	-0.034	14.4
Income	-0.016	10.6	-0.023	9.7
Attitudes and Beliefs	-0.003	2.0	0.000	0.0
Other Personal Characteristics	-0.011	7.3	-0.002	0.8
External Factors				
Healthcare Supply Capacity	0.000	0.0	0.000	0.0
Community Characteristics	-0.045	30.0	-0.047	20.0

Table 2.5a: Non-Linear Decomposition: Same ethnicity and different gender

	Have a regular source of care			
	Whites		**Hispanics**	
Women's Access to care	0.742		0.506	
Men's Access to Care	0.830		0.680	
Total Disparity	-0.088		-0.174	
Difference due to observed characteristics	-0.027		-0.049	
Difference due to unobserved characteristics	-0.061		-0.125	
	points	**%**	**points**	**%**
Internal Factors				
Citizenship Status and Language	0.000	0.0	-0.002	1.1
Insurance Status (Public Insurance)	-0.009	10.0	-0.026	14.9
Age	-0.002	2.2	-0.005	2.8
Income	+0.002	2.2	+0.003	1.7
Attitudes and Beliefs	-0.016	18.0	-0.009	5.1
Other Personal Characteristics	+0.002	2.2	-0.012	6.9
External Factors	0.000	0.0	+0.002	1.1

Table 2.3b: Non-Linear Decomposition: Between non-Hispanic whites and Hispanics

	Su Yun		Fairlie	
	Explained	Unexplained	Explained	Unexplained
Male	-0.002**	-0.020**	-0.000**	NA
Age 35-49	0.003**	-0.005	-0.002**	NA
Age 50-64	-0.032**	-0.008*	0.024**	NA
Married	-0.001	0.014*	0.001**	NA
Widowed/Divorced/Separated	0.001	0.004	-0.001**	NA
Family size	0.006*	-0.038**	-0.003	NA
Interviewed in English	-0.051*	-0.051	0.070**	NA
Citizen, U.S. born	-0.067**	-0.031**	0.046**	NA
Citizen, naturalized	0.011*	-0.007	-0.005	NA
Middle income	0.001*	-0.003	0.001**	NA
High income	-0.018**	0.002	0.018**	NA
High school	0.000	0.008	-0.000	NA
More than high school	-0.001	0.007	0.005*	NA
MSA	-0.003	-0.003	0.002**	NA
Northeast	-0.003*	-0.002	0.001**	NA
Midwest	-0.001	0.001	0.004**	NA
South	-0.001	-0.000	0.001**	NA
Private insurance	-0.073**	0.010	0.083**	NA
Public insurance	0.013**	0.001	-0.006**	NA
Both private and public insurance	-0.004**	0.002*	0.003**	NA
Excellent or very good physical health	0.002**	0.012	-0.002**	NA
Excellent or very good mental health	0.000	-0.050**	-0.000	NA
Paid-leave time to see a provider	0.001	-0.003	-0.002	NA
Not-paid-leave time to see a provider	-0.002**	-0.009	0.003**	NA
Health- do not need insurance	-0.004**	0.007**	0.004**	NA
More likely to take risks	-0.000	0.001	0.000	NA
Insurance not worth the money	-0.000	0.002	0.000**	NA
Can overcome illness without medical help	0.004**	-0.000	-0.005**	NA
Physicians per 1000 area residents	0.001	0.018	-0.001**	NA
Number of hospital beds per 1,000 area residents	-0.001	0.005	0.001	NA
Medicaid eligible	0.009	0.017	-0.010**	NA
People in poverty	-0.011	0.011	0.009**	NA
Hispanics	-0.044**	0.044	0.042**	NA
Whites	-0.002	0.052	0.002	NA
Constant				
Total	-0.269**	0.072	-0.282**	0.080
group_1 (Hispanics)	0.583**		0.566**	
group_2 (non-Hispanic Whites)	0.786**		0.768**	
Total Difference	-0.197**		- 0.202	

Notes: NA: not available in Fairlie decomposition

Table 2.4b: Non-Linear Decomposition: Same gender and different ethnicity

	Women		Men	
	Explained	Unexplained	Explained	Unexplained
Age 35-49	0.003**	-0.002	0.004**	-0.009
Age 50-64	-0.025**	-0.005	-0.038**	-0.011**
Married	-0.001	0.013	-0.003	0.016
Widowed/Divorced/Separated	0.000	0.006	0.001*	0.003
Family size	0.001	-0.019	0.009**	-0.049**
Interviewed in English	-0.060*	-0.082*	-0.044	-0.027
Citizen, U.S. born	-0.074**	-0.048**	-0.056**	-0.015
Citizen, naturalized	0.015*	-0.009	0.008	-0.005
Middle income	0.000	0.008	0.002**	-0.012
High income	-0.016**	0.002	-0.023**	0.000
High school	-0.000	-0.008	0.000	0.018*
More than high school	-0.005	-0.008	0.002	0.015**
MSA	-0.003	-0.018	-0.003	0.010
Northeast	-0.002	-0.001	-0.003*	-0.003
Midwest	-0.001	-0.000	-0.002	0.002
South	-0.002	-0.011	-0.001	0.009
Private insurance	-0.068**	0.023*	-0.077**	0.004
Public insurance	0.017**	0.006	0.008**	-0.001
Both private and public insurance	-0.003**	0.001	-0.004**	0.003
Excellent or very good physical health	0.003**	0.019	0.001	0.003
Excellent or very good mental health	0.000	-0.070**	0.000	-0.030
Paid-leave time to see a provider	-0.001	-0.006	0.005**	0.002
Not-paid-leave time to see a provider	-0.000	-0.006	-0.006**	-0.007
Health- do not need insurance	-0.004**	0.005	-0.004**	0.009**
More likely to take risks	-0.002**	0.005	-0.000	-0.003
Insurance not worth the money	-0.001	-0.000	-0.000	0.002
Can overcome illness without medical help	0.004**	0.005	0.004**	-0.006
Physicians per 1000 area residents	0.000	-0.018	0.001	0.047
Number of hospital beds per 1,000 area residents	-0.000	0.024	-0.001	-0.011
Medicaid eligible	0.013	-0.057	0.006	0.077*
People in poverty	-0.006	-0.011	-0.014*	0.028
Hispanics	-0.042**	0.038	-0.045**	0.047
Whites	-0.010	0.008	0.006	0.090
Constant		0.316*		-0.173
Total	-0.269**	0.119**	-0.269**	0.032
group_1 (Hispanics)	0.680**		0.506**	
group_2 (non-Hispanic Whites)	0.830**		0.742**	
Total Difference	-0.150**		-0.236**	

Table 2.5b: Probit Decomposition: Have a regular source of care: Same ethnicity and different gender

	Non-Hispanic Whites		Hispanics	
	Explained	Unexplained	Explained	Unexplained
Age 35-49	-0.001	0.002	-0.001	-0.005
Age 50-64	-0.001	0.015**	-0.004**	0.001
Married	-0.000	0.006	-0.002*	0.012
Widowed/Divorced/Separated	0.001	-0.003	-0.001	-0.003
Family size	-0.000	0.023*	0.000	-0.002
Interviewed in English	-0.000	-0.041	0.000	0.022*
Citizen, U.S. born	0.000	-0.040	-0.001	0.007
Citizen, naturalized	-0.000	-0.001	-0.001*	-0.005
Middle income	-0.000	0.001	0.002**	-0.021**
High income	0.002**	0.008	0.001*	0.002
High school	0.000	-0.008	-0.000	0.019*
More than high school	-0.001	-0.011	0.001	0.017**
MSA	0.000	0.001	-0.000	0.031
Northeast	-0.000	-0.000	-0.000	-0.002
Midwest	0.000	0.001	0.000	0.003
South	0.000	0.009	0.001	0.033**
Private insurance	-0.002	0.008	-0.004	-0.013
Public insurance	-0.006**	0.005**	-0.021**	0.003
Both private and public insurance	-0.001	0.001	-0.002*	0.003
Excellent or very good physical health	-0.000	0.011	-0.002**	-0.004
Excellent or very good mental health	0.000	-0.000	-0.001	0.038
Paid-leave time to see a provider	0.000	-0.015*	0.000	-0.004
Not-paid-leave time to see a provider	-0.001	-0.013	-0.006**	-0.018
Health- do not need insurance	-0.005**	0.001	-0.004**	0.004
More likely to take risks	-0.005**	0.009**	-0.001	-0.000
Insurance not worth the money	-0.001	0.002	-0.001	0.005
Can overcome illness without medical help	-0.005**	0.006	-0.003**	-0.008
Physicians per 1000 area residents	0.000	-0.024	-0.000	0.044
Number of hospital beds per 1,000 area residents	0.000	0.006	-0.001	-0.029
Medicaid eligible	0.000	-0.022	0.000	0.112**
People in poverty	-0.000	-0.038	0.001	-0.012
Hispanics	-0.000	-0.001	0.001	0.012
Whites	-0.000	-0.083	-0.000	0.008
Constant		0.111		-0.380**
Total	-0.027**	-0.061**	-0.049**	-0.125**
group_1 (Men)	0.742**		0.506**	
group_2 (Women)	0.830**		0.680**	
Total Difference	-0.088**		-0.174**	

Chapter 3: The Impact of Patient-Provider Racial and Ethnic Concordance on Patient Satisfaction in the United States

3.1. Introduction

The disparities in health care experienced by racial and ethnic groups in the United States are well documented. Numerous studies suggest that minorities are less likely to be insured, less likely to have a regular source of care, and less likely to receive timely and needed care compared to their white counterparts (Lillie-Blanton, Maleque, and Miller, 2008; National Healthcare Quality and Disparities Report, 2011; Kirzinger, Cohen, and Gindi, 2011). Interest in ways to reduce the health care disparities faced by racial and ethnic minorities has driven the debate over whether or not creating a more representative health care work force will result in higher satisfaction among minority patients, better access to care, and more positive health outcomes for these groups.

The ways in which increasing the diversity of the health care workforce may help improve health care access and, subsequently, the health outcomes of minorities have been detailed in a report by Health Resources and Services Administration (HRSA 2006). This report posits that minority physicians may possess culturally specific knowledge and experience that may reduce obstacles to the patient-physician communication for minority patients. Therefore, increasing the diversity of the health care workforce may result in better communication between patients and providers and a higher level of trust in a health care system staffed by larger numbers of minority providers (HRSA 2006).

Some studies have found evidence supporting the underlying hypothesis of the HRSA (2006) report. These studies have demonstrated that racial and ethnic concordance between patients and providers may lead to a higher likelihood of return for follow up care (Safran *et al.*, 1998), longer visits (Cooper *et al.*, 2003), and a greater likelihood of using health care

services (Laveist, Nura-Jeter, and Jones, 2003; Strumpf, 2011). Studies have also shown that patient-provider race concordance is positively associated with a greater likelihood of satisfaction with provider care among Black and white patients; however, there is a lack of empirical evidence to support this proposed relationship for Hispanics. Furthermore, the empirical findings for Hispanics and their satisfaction with racially and ethnically concordant providers are mixed. For instance, studies have shown that although Hispanics are more likely than any other ethnic group to rely solely on their provider's medical advice rather than seeking out information themselves (Levinson *et al.*, 2005), they are also less likely to be satisfied with the overall healthcare they receive, and in some cases, even racial and ethnic concordance with their providers may not predict Hispanic's satisfaction (Hall and Dornan, 1990; Merrill and Allen, 2003).

The variations in the findings for Hispanics point to the need for further investigation. Using the household component of the 2009, 2010, and 2011 Medical Expenditure Panel Surveys, this study explores the relationship between racial and ethnic concordance and how Hispanics perceive the quality of their health care (using non-Hispanic whites' perception of satisfaction for comparison). The goal is to provide greater insight into whether or not diversifying the health care workforce will improve Hispanics' satisfaction with the health care they receive from their provider. My findings show that diversifying the workforce in terms of the race and ethnicity of providers may not be enough to provide adequate and satisfactory medical care to minority individuals, especially Hispanic men.

3.2 Background

3.2.1 Rationale for Diverse Medical Workforce

Diversifying the health care workforce is a commonly suggested way to accomplish cultural competent care;[18] however, there is a longstanding and significant shortage of ethnic minority providers in the United States. According to the Association of American Medical Colleges, 6.3 percent of the total number of physicians in the United States are Black and only 5.5 percent are Hispanic/Latino compared to the 75.0 percent that are Non-Hispanic white (AAMC, 2010). With such an extreme disparity in numbers, Hispanic patients likely experience difficulty finding a provider from their own ethnic background. A more diversified health workforce would increase the chances of minority patients being able to see a provider from their own racial and ethnic group, which in turn may increase the quality of communication between patient and provider. Fundamental to the hypothesis supporting racial and ethnic concordance is the notion that this concordance may result in improved communication. Quality communication is important in clinical settings because it may increase the accuracy of shared information and the quality of culturally competent care, which could lead to more appropriate diagnoses and treatments which may in turn improve outcomes for minority individuals.

Studies show that racial and ethnic matching is driven by both patients and providers. For instance, when given a choice, minority patients are more likely to seek out race-concordant physicians, even to the point of overcoming geographical barriers limiting accessibility. This is in part due to their expectations of having shared social and cultural beliefs (Saha *et al.*, 2000a; Chen *et al.*, 2005). And even when physicians are given a choice of where to practice, minority providers are more likely than non-minority providers to be willing to practice in neighborhoods with larger minority populations and serve poor and

[18] Betancourt, Green, and Carillo (2002) define cultural competence as followed: "*the ability of systems to provide care to patients with diverse values, beliefs and behaviors, including tailoring delivery to meet patients' social, cultural, and linguistic needs"* (Betancourt, Green, and Carillo, 2002, page v).

uninsured minority patients (HRSA 2006). That both groups currently overcome obstacles in search of concordance strengthens the argument that promoting a diverse heath workforce will increase the chances of matching patient and providers of the same race and ethnicity and will ensure a responsive health care system to the needs of minority populations (AAMC, 2010).

3.2.2 Racial and ethnic concordance and Hispanics

Studies examining Hispanics' satisfaction with health care can be grouped into three categories. The first looks only at Hispanics' satisfaction from the care they receive without controlling for the provider's race and ethnicity, the second looks at both racial and ethnic concordance and satisfaction, and the third looks at gender concordance and satisfaction.

Studies that fall in the first category, in general, have shown that Hispanics are frequently dissatisfied with the care they receive from their provider; however, the magnitude of their dissatisfaction and the significance may differ from one dimension of satisfaction to another, indicating the complex nature of using the term "satisfaction" to describe a multidimensional phenomenon. For instance, using the 2000 Behavior Risk Factor Surveillance system, Merrill and Allen (2003) found that Hispanics in general are less likely to be satisfied with their provider's listening skills (but not with their provider's explanation skills, the amount of time spent, or the amount of respect they were shown), even after controlling for other socio-demographic characteristics (such as age, income, education, etc.). In addition, Morales and his colleagues (1999), surveying 7,093 patients from the West Coast, found that Hispanics with language barriers are more likely to be dissatisfied with the quality of the care (i.e. listening skills, explanation aspects for prescription drugs and medical

procedures, and the amount of support they got from their doctors) they received when compared to non-Hispanic whites.

In regards to racial and ethnic concordance and Hispanics' satisfaction with their medical care, the empirical findings are mixed, and no clear pattern of findings emerges; although the trend shows a positive association (Meghani *et al.*, 2009). For instance, using the 1994 Commonwealth Fund's Minority Health Survey, LaVeist and Nuru-Jeter (2002) created an index of patient's rankings of how well their provider performs by compiling five questions from the survey: providing good health care, treating you with dignity, making sure you understand what you've been told, listening to your health problems, and being accessible by phone or in-person. The authors found that being in concordance increased Hispanic patient's satisfaction from their providers compared dis-concordant patients.

However, also using the 1994 Commonwealth Fund's Minority Health Survey, Saha *et al.* (1999) found that racially and ethnically concordant Hispanics are more likely to be satisfied with their health care (1.74 times) compared to dis-concordant Hispanics, while Hispanics did not report greater likelihood of satisfaction with their concordant provider. One note of caution is that Saha and her colleagues measured patient satisfaction differently from LaVeist and Nuru-Jeter (2002), using the survey questions "overall how satisfied are you with the quality of your health care?" and "overall how satisfied are you with your regular physician?" to predict the impact of concordance on patient satisfaction. These findings point out that the impact of racial concordance on satisfaction may differ based on how satisfaction is measured.

Saha, Arbelaez, and Cooper (2003), using the 2001 Commonwealth Fund's Health Care Quality Survey, found that racial and ethnic concordance improved Hispanic's

satisfaction (odds ratio 1.45), but only for the amount of time spent with their provider, and that concordance does not impact Hispanic's satisfaction as measured by other indicators (whether the doctor explained clearly, involved the patient in decision making, spent enough time, and showed respect) nor does it impact their probability of using health services. In contrast to other studies, Martin, Shi, and Ward (2009), using the 2003 Medical Expenditure Panel Survey, found that racial and ethnic concordance does not predict the rating of the quality of providers' communication (measured by whether or not the provider asks questions about other treatments, involves the patient in decision making, shows respect, and explains treatment options to person).

One recent study by Chen *et al.* (2005) points out that a patient's specific preferences for the race and ethnicity of their physician matters for their satisfaction. For instance, they report that one third of Hispanics preferred providers with their same race and ethnicity. Hispanics who both preferred a Hispanic provider and had one were more likely to be satisfied with their provider (about 10 percentage points) than Hispanics who preferred a Hispanic provider but had a non-Hispanic provider. In another study, Villani and Mortensen (2014) incorporate the degree of acculturation into their models of racial and ethnic concordance and satisfaction. They explored the disparities in satisfaction between English speaking Hispanics and Spanish Speaking Hispanics by using the 2007 through 2009 Medical Expenditure Panel Surveys. The authors found that racial and ethnic concordance did not explain the gap in satisfaction between these two groups; however, differences in acculturation explains up to 77 percent of the gap.

There is lack of literature on how gender concordance affects Hispanic's satisfaction with their health care. Although studies have shown that there are differences between

physicians that are gender based,[19] these differences do not always appear to be at play in patient satisfaction. For instance, Martin, Shi, and Ward (2009) found no impact of gender concordance on patient satisfaction, while Cooper-Patrick *et al.* (1999), surveying 1816 primary care patients, found that gender concordance did increase the probability of being satisfied[20] with the provider. In another study, Schmittdiel *et al.* (2000), using data from the Northern California Kaiser Permanente Medical Program, found that male gender dis-concordant patients were more satisfied with their providers than female gender concordant patients. However, none of these studies took the racial and ethnic background of the patients into consideration in their analyses.

3.3 Theoretical Model

Studies have shown that the quality of patients' communication with their provider is a very important component of their medical care and may have significant health consequences. Patient evaluations of quality of provider care are often used as a measurement of patient satisfaction with the care they receive. For the purpose of this analysis I consider satisfaction with the quality of care to be an important aspect of health production (i.e. individuals who are satisfied with their provider will be more efficient in their production of health), and I use Strauss and Thomas' (1998) health production function from chapter 2 of this dissertation to model patient satisfaction with health care and identify the variables that produce that satisfaction. In light of the derived demand function in Chapter 2 and available data, I group the variables that may impact an individual's

[19] Female physicians tend to possess traits such as working to build partnerships with patients, asking questions, giving information, and being empathetic (Roter, 1991).

[20] The authors created an index from four satisfaction questions: (1) overall health care; (2) their physicians' technical skills, such as thoroughness, carefulness, and competence; (3) their physician's explanation of their problem and its treatment; and (4) their physicians' personal manner, such as courtesy, respect, sensitivity, and friendliness.

satisfaction with care into three: *technology parameters* such as age, marital status, education, acculturation, English proficiency, perceived physical and mental health status, and racial and ethnic concordance; *prices and income* such as employment status, income status, and health insurance coverage; and finally *environmental characteristics* such as place of residence and metropolitan area status.

3.3.1 Technology Parameters

Racial and ethnic concordance is an important factor impacting the patient-provider relationship and patient satisfaction; however, in light of the previous studies mentioned above, its importance differs across racial groups. Particularly, Hispanic patients do not always show a higher likelihood of satisfaction when they have concordant providers. Studies also show that the quality of patient-provider relationships is of greater importance for older respondents, and the literature shows a positive association between age and satisfaction. For instance, older patients are in general more likely to be satisfied with the health care than younger and middle age patients (Jackson *et al.*, 2001; Rahymqvist, 2001; Merril and Allen, 2003). Studies analyzing patient gender and satisfaction did not find a difference in overall satisfaction based on the patient's gender (Weisman *et al.*, 2002; Woods and Heidari, 2003; Afzal *et al*, 2014). However, Weisman *et al.* (2002) argue that the perception of the quality of patient-provider communication may differ based upon gender (i.e women are more likely to share emotional information in medical encounters than men), and they suggest that a greater number of gender sensitive satisfaction questionnaires are needed to accurately capture the differences between the two (Weisman *et al.*, 2002).

Although not all studies have found this relationship (Quintana *et al*, 2006), being married is in general positively associated with satisfaction with health care (Hall and

Dornan, 1990). Level of education has also been found to be a predictor of patient satisfaction; however, findings are mixed. For instance, some studies have found that having more than a high school education was positively associated with satisfaction with health care (Merrill and Allen, 2003), some found the opposite (Hall and Doman, 1990) and others found no association (Laveist and Nuru-Jeter, 2002, Wallace *et al.*, 2007).

Language proficiency has been frequently used to assess the barriers minority patients face in health care settings. Studies find that minority patients who face language barriers are significantly less likely to be satisfied with the quality of care they receive from their providers (Hu and Covell, 1986; Morales *et al.*, 1999). Furthermore, using interpreters does not improve their satisfaction to the level of that of English speakers (Escarce and Kapur, 2006). Some studies use language proficiency as a proxy measure of Hispanic's acculturation; however, Wallace *et al.* (2009) point out that this effect cannot be captured using language proficiency alone. Some studies have developed acculturation scales from the language used in the interview, the language used at home, generational status (i.e first generation or not), and proportion of life lived in the United States (Cruz *et al.*, 2008). The degree of acculturation and how it affects patient health behavior is a relatively new area of research, and only few studies have explored the impact of acculturation on patient satisfaction. For instance, Laveist and Nuru-Jeter (2002) used whether a person was born in the United States and the number of years lived in the United States as a proxy for acculturation; however, the authors did not find an association between acculturation and patient satisfaction. Furthermore, Villani and Mortensen (2014) found acculturation (measured by a three item scale comprised of the language spoken at home, the language of

the interview, and the proportion of life spent in the United States) to be a large contributor to the disparities in satisfaction between English and Spanish speaking Hispanics.

3.3.2 Prices and Income

Studies also have examined financial barriers, such as low income and/or lack of health insurance, and their impact on patient satisfaction. Laveist and Nuru-Jeter (2002) found that higher income patients are more likely to be satisfied with their providers. Merrill and Allen (2003) found that having a higher income is positively associated with satisfaction but only with the doctor's explanation of medical aspects of their visit (but not with the doctor's listening skills, amount of respect shown to the patient, and amount of time spent with the patient). However, Hall and Dornan (1990) did not find any significant impact of income on satisfaction with medical care. While the findings regarding higher income and patient satisfaction are mixed, findings on having health insurance suggest a positive association (Morales, 1999; Laveist and Nuru-Jeter, 2002). For instance, Laveist and Nuru-Jeter (2002) found that having health insurance is positively associated with patient satisfaction. Employment status has rarely been controlled for in studies of patient satisfaction, and no studies have found an association between employment status and patient satisfaction (Martin, Shi and Ward, 2008). It is likely that the impact of employment is mediated by the level of income and health insurance status.

3.3.3 Environmental Characteristics

Satisfaction with the quality of care received from a doctor is highly influenced by the patient's perceived health status. Studies consistently find that low mental and physical health status is negatively associated with satisfaction from care (Hall, Milburn, and Roter, 1998; Jackson *et al.*, 2001; Merrill and Allen, 2003). This may be in part due to individuals

who have health problems having greater expectations from their care than individuals in good health (Merrill and Allen, 2003).

Environmental characteristics (such as place of residence and metropolitan statistical area status) are less frequently taken into consideration to analyze patient satisfaction. Only four of the studies I reviewed for this study have controlled for metropolitan statistical area status and/or place of residence: Villani and Mortensen (2014), Wallace *et al.* (2009), Saha, Arbelaz and Cooper (2003), and Saha *et al.* (1999). However, these studies do not report whether or not metropolitan statistical area status and/or place of residence have an impact on patient satisfaction.

3.4 Review of Literature

Although the literature reviewed here enhances our understanding of concordance and its impact on satisfaction for Hispanics, our ability to draw conclusions from these findings is hampered by the mixed nature of the results. When taken into consideration with other factors (such as acculturation) that may contribute to patient satisfaction but are not routinely measured, these results indicate the need for additional exploration. Given that policies may be determined based on the intuition that matching is good for patient-provider relationships, more work is needed to inform resource allocation based on evidence from further empirical research.

In this study, I address the gaps in the literature by taking into consideration factors such as acculturation and patient-provider racial and ethnic and gender concordance to provide a thorough examination of Hispanic's satisfaction with care.

I measure satisfaction following the literature using patient rankings of their provider in these dimensions: provider's listening skills, explanation skills, the amount of respect

he/she shows the patient, and the amount of time spent with the patient. Even though some studies have created indices from the available satisfaction measures, other studies have evaluated these measures separately, treating satisfaction as a multidimensional concept. I also evaluate each measure separately to avoid confounding my results. Previous studies have frequently converted patient rankings in each category into binary outcome variables (where always = 1 and usually, sometime, and never = 0) in order to estimate the probability of being satisfied with provider care. I will follow this convention by using binary measures and adopting a Probit model to estimate the probability of being satisfied with provider care.

3.5 Data

I make use of the household component of the Medical Expenditure Panel Survey (MEPS) to analyze the impact of provider and patient racial and ethnic and gender concordance on patient satisfaction with provider care. The MEPS is sponsored by the Agency for Healthcare Research and Quality (AHRQ), and it provides comprehensive information on health care utilization, access to care, insurance coverage status, and health status along with socioeconomic characteristics for a nationally representative, non-institutionalized segment of the U.S. population.

In order to increase the sample size of the Hispanic subgroup, I combine data from the household component of the MEPS 2009, 2010, and 2011. I limit my sample to respondents who were between the ages of 18 and 64 at the time of the survey, since the health care behavior of the elderly is a different category of research. I include respondents who had a provider visit in the 12 months prior to the survey in my final sample. My final sample size includes 4,861 non-Hispanic white women, 3,830 non-Hispanic white men, 1,611 Hispanic women, and 1,212 Hispanic men. The sampling designs play an important

role in making the data nationally representative; therefore these designs are taken into account in my analysis.

3.5.1 Outcome Variables

The MEPS asks respondents who had a healthcare visit in the year prior to the survey several questions to assess their satisfaction with their medical care provider. These questions are: “In the last 12 months, how often did doctors or other health providers 1) listen carefully to you, 2) explain things in a way you could understand, 3) show respect for what you had to say, and 4) spend enough time with you?” The possible responses are: “never,” “sometimes,” “usually,” and “always.” As in Villani and Mortensen (2014), I construct each satisfaction outcome variable as a binary outcome variable with 1 reflecting “always” responses and 0 representing “never,” “sometimes,” and “usually.”

Table 3.2 presents satisfaction as measured by responses to the above questions, demonstrating that Hispanics experience significantly lower satisfaction than non-Hispanic whites. For instance, Hispanics are less satisfied with the amount of time their health care provider spent during a visit compared to non-Hispanic whites. Only about 42 percent of Hispanics report satisfaction with the amount of time spent with their providers compared to 54 to 56 percent of non-Hispanic whites. Hispanics are less likely to be satisfied with the communication aspects of their visit, as 52 to 54 percent of Hispanics are satisfied with how their health care providers explained medical issues to them and listened to them compared to 63 to 66 percent of non-Hispanic whites who reported satisfaction with these aspects. While about 60 percent of Hispanics did report that their healthcare providers always showed respect, this percentage is slightly higher (66 percent) for non-Hispanic whites.

3.5.2 Explanatory Variables

I control for the explanatory variables that have been identified in the economic model. I also control for fixed effects for survey years to adjust for any possible annual shocks.

Race and ethnicity: The MEPS asks each respondent their race and ethnicity. I categorize race and ethnicity as Hispanic (i.e Puerto Rican, Cuban/Cuban American, Dominican, Mexican/Mexican American, Central or South American) and non-Hispanic white. Respondents also report their provider's demographic information in such categories as racial and ethnic background and gender (as perceived by the patient). This allowed me to construct four binary variables: a racial and ethnic concordance explanatory variables (1 is racial and ethnic concordance between the patient and provider, and 0 is otherwise) and a gender concordance explanatory variable (1 is gender concordance between the patient and provider, and 0 is otherwise) for each non-Hispanic white women, non-Hispanic white men, Hispanic women, and Hispanic men.

Acculturation: For this study I use the language of the interview and the proportion of life a respondent has lived in the United States to capture acculturation. The MEPS interviewer records the language used during the interview, therefore I use interview language as a proxy to measure acculturation. If a respondent completed the interview only in English I assumed the respondent is comfortable speaking English (as opposed to Spanish or both Spanish and English). MEPS also asks respondents how long they have been in the United States. I assign respondents born in the U.S. a 1, and for those who are foreign born I calculate a proportion based on their time spent in the United States divided by their age reported at the time of the survey.

Age and Marital Status: I grouped age into three categories: 18 to 34, 35 to 49, and 50 to 64. The MEPS updates respondents' marital status in each round of interviews. I use the respondent's end of year marital status to classify respondents into three categories: currently married, divorced, widowed or separated, and never married.

Employment: The MEPS asks employment question to respondents 16 and older during each interview round. If the respondent is currently employed (or was employed at any time since the previous round) they are categorized as employed (otherwise as not employed).

Income Status: The MEPS reports the poverty status for each respondent by using measures of family income (adjusting for size and composition) and poverty statistics developed by the Current Populations Survey (CPS). The categories poor (less 100%), near poor (100% to less than 125%), and low income (125% to less than 200%) are categorized for this analysis as "Low Income." I categorized middle income (200% to less than 400%) as "Middle Income" and high income (greater than or equal to 400%) as "High Income."

Education: I used the highest degree at the time of the interview as my education measure: less than high school, high school degree or GED, or more than high school degree.

Region and Metropolitan Statistical Area (MSA): Respondents are asked which Census region they reside in during each round. I used the year end interview to determine the region in which each respondent lives. Appendix A shows the MEPS categories of the states included in each region. I also control for MSA status with a binary variable where 1 corresponds to living in an MSA and 0 corresponds to living outside of an MSA.

Insurance Status: The MEPS collects comprehensive information on the health insurance coverage of respondents and reports whether or not a respondent was covered by

public insurance or private insurance during each month of the year. The MEPS classifies coverage such as Tricare, Medicare, Medicaid or SCHIP, or other public hospital and physician programs under public insurance. I created four health insurance categories to capture the duration and type of health insurance coverage that each respondent had during the full year: fraction of private coverage, fraction of public coverage, fraction of both private and public coverage, or fraction of uninsured during the full year. For instance, a fraction of 1 for private coverage indicates that the respondent was fully covered over the full year.

Perceived Health Status: Perceived health status measures used in this study reflect self-reported mental and physical health status. The MEPS asks each respondent to rank their mental and physical health status on five-point scales ranging from poor to excellent. I distinguish between those with poor, fair, or good health (=0) from those who report very good or excellent health (=1).

Race and gender summary statistics are provided in Table 3.1. These statistics show that Hispanics are younger (around 24 to 32 percent of Hispanics are between the ages of 18-34) compared to their non-Hispanic white counterparts (at about 21 percent). Compared to non-Hispanic whites, Hispanics are less likely to be comfortable speaking English (up to 65 percent). About 33 percent of Hispanic women and 26 percent of Hispanic men fall into the low income category. By contrast, non-Hispanic whites, both men and women, are more likely to have higher income (up to 58 percent) and more likely to live in metropolitan statistical areas (up to 93 percent). Non-Hispanic whites are more educated than Hispanics; up to 25 percent of Hispanics have less than a high school education compared to 7 percent of non-Hispanic whites. There is very little difference across all the groups for high school or GED level education, but up to 48 percent of non-Hispanic whites have at least some college

degree compared to only 31 percent of Hispanics. The mean duration of private health insurance coverage is about 9.6 months (0.80*12) for non-Hispanic whites compared to 8 months for Hispanics. The mean duration of being uninsured for Hispanics is about 2 months compared to less than a month for non-Hispanic whites. Hispanics have longer public health insurance on average, particularly Hispanic women (1.6 months). All groups reported similar rates of excellent or very good mental health status. However, the tendency to report excellent or very good physical health is lower for Hispanics (80 percent) than for non-Hispanic whites (up to 86 percent).

Both non-Hispanic white women and Hispanic women report lower gender concordance (about 37 percent) than non-Hispanic white men (82 percent) or Hispanic men (78 percent). Up to 87 percent of non-Hispanic whites report that their providers share the same racial and ethnic background with them compared to 33 percent of Hispanics. In a system with a very low level of minority representation among providers, my data is consistent with other studies (Saha *et al.*, 1999) and demonstrates that Hispanics have a preference for racially concordant providers.

3.6 Econometric Model

I investigate the factors that influence the "satisfaction" outcome variable using a Probit model. The expected probability for this analysis can be calculated by using the equation:

$$Satisfaction_i^* = S_i^* = x_i'\beta + \epsilon_i \qquad \epsilon_i \approx N(0, \sigma_1^2)$$

where S_i^* represents the unobserved latent variable for individual i and $x_i$is a vector of factors such as individual characteristics such as racial and ethnic ethnicity (Model 1), age, marital status, region, income, education, insurance status, employment, proportion of life lived in

the U.S and the interview language (Model 2), and patient-provider racial and ethnic and gender concordance (Model 3).

The value of the β coefficients will determine the relationship between explanatory variables (x_i) and outcome variables (S_i^*) (i.e $\beta > 0$ indicates a positive relationship and β<0 indicates a negative relationship). The ϵ_i is an error term in this equation. We can observe $S_i = 1$ if and only if $S_i > 0$ and $S_i = 0$. The binary choice model is $P\{S_i = 1\} = F(x_i'\beta)$ where F is standard normal distribution. I report marginal effects in estimation tables 2 and 3.[21]

3.7 Results

Tables 3.2 and 3.3 present the marginal effects for each of the patient satisfaction with care variables. I report unadjusted marginal effects in Model 1. Results from the Model 1 suggest that Non-Hispanic white women's satisfaction is not different from that of non-Hispanic white men in general (the only exception is that non-Hispanic white women are less likely to be satisfied with their provider's listening skills). Hispanic men are consistently less likely than non-Hispanic white men to be satisfied with provider care across each of the patient satisfaction variables considered here. The only exception to this trend is the amount of respect shown by their provider; the probability of Hispanic men being satisfied with this aspect of care is not statistically different from that of white men. Hispanic women are also less likely to be satisfied with the amount of time spent by their providers and their provider's listening skills compared to non-Hispanic white men; however, these patterns fade away for both Hispanic men and women in the categories of listening, explanation, and respect when I control for the other explanatory variables in Model 2.

[21] Marginal effects derived from $f(x_i'\beta)\beta$ where $f(x_i'\beta)$ denotes the standard normal density function.

The results in Model 2 also suggest that older respondents (those in the 50-64 age category) are more likely to be satisfied with their doctor's listening skills, the amount of respect shown to them by their provider, and the amount of time spent during the examination than their younger counterparts (those in the 18-34 age category). Respondents who have health insurance are more likely to be satisfied with the quality of their medical care compared to those who lack insurance; however, when compared to those with low income, having a higher income only improved the probability of being satisfied with the explanation of aspects of their medical care and the amount of respect shown to them by their provider. Neither higher level of education nor English fluency improved satisfaction. However, both the acculturation indicator, increased proportion of life lived in the United States, and having excellent or very good mental and physical health increased the probability of being satisfied with the quality of medical care (14 to 19 percentage points and up to 9.7 percentage points respectively).

When I control for racial and ethnic and gender concordance in Model 3, the results indicate that non-Hispanic whites who have racial and ethnic concordance with their providers are more satisfied with the quality of their medical care than their non-concordant white counterparts. For instance, with racial and ethnic concordance, non-Hispanic whites are more likely to be satisfied with the respect shown to them by their provider (6.5 percentage points for women, 7.5 percentage points for men), and they are more likely to be satisfied with the explanation of aspects of their medical care (6.2 and 13.1 percentage points respectively). For the amount of time spent during the examination, both non-Hispanic white women and men are satisfied with their concordant provider (5.5 and 12.0 percentage points respectively), while satisfaction with a doctor's listening skills is only significant for non-

Hispanic white women (7.5 percentage points). However, neither non-Hispanic white men nor non-Hispanic white women report greater satisfaction (as measured by any of the satisfaction variables) with their care when experiencing gender concordance.

My results indicate that Hispanic women are statistically indifferent to concordance (racial and ethnic or gender) in terms of satisfaction. However, the impact of racial and ethnic concordance on Hispanic men's satisfaction stands out. Specifically, when Hispanic men are racially concordant with their providers they are less likely to be satisfied with their provider's listening skills (11.8 percentage points) or explanations of aspects of their medical care (10.7 percentage points) than their non-concordant counterparts.

Examining each of the patient satisfaction with provider care variables by age group (Table 3.4) suggests that Hispanic men's dissatisfaction with concordant provider's care does not resolve as they age, especially for the listening skills of their provider. On the other hand, Hispanic women's satisfaction with a racial and ethnically concordant provider's care in general shows a positive direction as they age (Table 3.4).

3.8 Discussion and Conclusions

Improving the minority representation among physicians in the United States to address issues of health disparities among minority groups has been a popular solution proposed by policy makers and researchers alike. However, despite the intuitive attractiveness of this approach, little is known about how achieving such representation (and therefore increasing the chances of concordance) would have on the medical care experiences of minorities. The research findings are mixed on the effects of concordance, but little improvement in patient satisfaction based on concordance has been demonstrated for Hispanics. This study seeks to address the gaps in the literature concerning concordance and

satisfaction among Hispanics using the household component of the Medical Expenditure Panel Surveys from 2009, 2010, and 2011. I created satisfaction outcome variables from survey questions about satisfaction with their medical provider, then examined the presence of racial and ethnic and gender concordance between patient and provider and the level of an individual's acculturation to gain insight into how these factors affect their satisfaction with their medical care for Hispanics and non-Hispanic whites in the United States. The ultimate goal was to determine whether or not matching was good for the patient/provider relationship and if it had a positive impact on Hispanic's overall satisfaction with their medical care.

Consistent with other studies, I find that older respondents are more satisfied with their medical care, and insurance status and income level improve patient satisfaction with their medical care, but there is no difference in satisfaction between those with higher and lower levels of education or different levels of English proficiency. Acculturation is important when considering patient satisfaction, as those who have spent a greater proportion of their lives in the U.S. report higher levels of satisfaction with their medical care than less acculturated individuals. An important implication of this particular finding is that it stresses the need for more culturally competent care for those immigrants who are newly arrived, as their lower levels of acculturation have a negative impact on their level of satisfaction with their care. These individuals may have expectations for medical care that are still being influenced by conditions in their country of origin. Understanding how this affects their relationships with their providers is important, because it could lead to the incorporation of this knowledge into the patient/provider encounter. This goes beyond concordance because it emphasizes that the connection between care and cultural competence may be more important than mere concordance between patient and provider.

Another important consideration my findings show is that there is a lack of homogeneity within Hispanic populations. For instance, although both Hispanic women and men prefer racially and ethnically concordant providers, Hispanic women are, in general, statistically indifferent to that concordance (racial and ethnic and gender) in terms of overall satisfaction with their care. However, even when controlling for acculturation, Hispanic men are more likely to be dissatisfied with some aspects of their medical care when they are racially and ethnically concordant with their provider. It appears as if Hispanic men's satisfaction is most strongly related to the communication aspects of provider care, so a potential remedy to their reported dissatisfaction needs to address how providers are communicating with members of this population, regardless of concordance. This is one piece of the satisfaction puzzle for Hispanic men that may also be addressed through improving culturally competent care. Further research needs to determine what aspects of cultural competency providers need to develop and what strategies for training physicians will best serve this population.

Table 3.1:Descriptive Statistics

	White, non-Hispanic		Hispanic	
	Women	Men	Women	Men
Sample Size	4,861	3,830	1,611	1,212
Doctors or other health providers always…				
showed respect	66.4	65.2	59.8	59.5
spent enough time	54.6	56.7	42.6	42.7
explained things in a way you could understand	63.7	61.6	54.2	52.3
listened carefully to you	63.0	66.0	53.2	54.2
Concordance and Acculturation				
Patient-provider gender concordance	37.8	82.0	36.4	78.4
Patient-provider racial concordance	87.2	87.7	31.6	33.2
Proportion of life has lived in the U.S.	0.98	0.98	0.78	0.77
	(0.093)	(0.093)	(0.286)	(0.017)
Interview in English only	99.9	99.7	66.4	64.4
Age range				
18-34	21.2	19.5	32.4	24.5
35-49	30.7	27.8	36.1	39.0
50-65	48.0	52.5	31.4	36.3
Marital Status				
Married	62.3	65.5	55.3	58.0
Widowed/Divorced/Separated	19.6	12.6	20.5	14.7
Never married	17.9	21.8	24.2	27.2
Income Status				
Low Income	18.7	16.1	33.0	26.8
Middle Income	28.6	25.8	35.7	33.8
Higher Income	52.6	58.0	31.2	39.3
Education				
Less than high school	5.2	7.5	21.4	25.2
High school	46.4	44.9	46.8	43.4
More than high school	48.2	47.6	31.6	31.3
Region and MSA status				
MSA	82.2	83.4	92.9	93.2
West	16.7	15.6	31.8	27.7
Northeast	22.1	23.0	18.0	20.3
Midwest	24.9	25.4	8.7	12.9
South	36.1	35.8	41.3	38.9
Insurance status				
Private insurance	0.78	0.80	0.62	0.68
	(0.392)	(0.379)	(0.466)	(0.450)
Public insurance	0.09	0.08	0.18	0.13
	(0.286)	(0.270)	(0.368)	(0.335)
Both private and public insurance	0.03	0.04	0.02	0.03
	(0.163)	(0.186)	(0.141)	(0.159)
Uninsured	0.08	0.07	0.16	0.14
	(0.250)	(0.234)	(0.337)	(0.330)
Perceived Health Status				
Excellent or very good physical health	86.8	85.1	80.0	80.0
Excellent or very good mental health	91.2	91.7	90.3	89.8
Employment				
Employed	71.6	78.3	68.6	76.5
Unemployed or not in the labor force	28.4	21.6	31.3	23.4

Source: Authors' calculations from the Medical Expenditure Panel Survey, 2009, 2010, and 2011.
Notes: Standard deviations in parentheses. Standard deviations are only reported for continuous measures. Weighted Estimates are reported.

Table 3.2: Determinants of Patient Satisfaction

	Doctor Listened			Doctor Explained so Understood		
Non-Hispanic white women	-0.034**	-0.034**	-0.055	-0.002	-0.000	0.069
	(0.014)	(0.014)	(0.043)	(0.012)	(0.012)	(0.043)
Hispanic men	-0.096**	-0.041	-0.048	-0.073**	-0.023	0.077
	(0.026)	(0.028)	(0.063)	(0.027)	(0.032)	(0.057)
Hispanic women	-0.059**	-0.003	0.028	-0.035	0.020	0.139**
	(0.021)	(0.024)	(0.044)	(0.022)	(0.025)	(0.038)
Racial Concordant white women			0.073**			0.062**
			(0.027)			(0.028)
Racial Concordant white men			0.047			0.131**
			(0.034)			(0.035)
Racial Concordant Hispanic men			-0.118**			-0.107**
			(0.044)			(0.042)
Racial Concordant Hispanic women			0.023			-0.008
			(0.032)			(0.039)
Gender Concordant white women			-0.011			-0.025
			(0.020)			(0.021)
Gender Concordant white men			-0.003			-0.000
			(0.026)			(0.028)
Gender Concordant Hispanic men			0.102*			0.052
			(0.053)			(0.053)
Gender Concordant Hispanic women			-0.015			-0.055
			(0.033)			(0.038)
Proportion of life lived in US		0.158**	0.150**		0.180**	0.172**
		(0.042)	(0.043)		(0.045)	(0.045)
Interview in English		0.014	0.009		-0.025	-0.032
		(0.033)	(0.034)		(0.034)	(0.035)
Age 35-49		0.015	0.016		0.016	0.019
		(0.019)	(0.019)		(0.022)	(0.022)
Age 50-64		0.043**	0.044**		0.032	0.033
		(0.019)	(0.019)		(0.022)	(0.022)
Married		0.010	0.008		0.024	0.020
		(0.022)	(0.022)		(0.019)	(0.019)
Widowed/Divorced/Separated		0.021	0.020		0.038*	0.035*
		(0.025)	(0.025)		(0.021)	(0.020)
Middle income		-0.008	-0.009		0.002	0.000
		(0.018)	(0.018)		(0.017)	(0.017)
High income		0.025	0.025		0.043**	0.042**
		(0.019)	(0.019)		(0.019)	(0.018)
High school or GED		-0.010	-0.011		-0.009	-0.010
		(0.023)	(0.023)		(0.022)	(0.022)
More than high school		-0.028	-0.031		-0.003	-0.006
		(0.024)	(0.024)		(0.023)	(0.023)
Private insurance		0.053**	0.053**		0.053**	0.054**
		(0.024)	(0.024)		(0.024)	(0.024)
Public insurance		0.065**	0.069**		0.054*	0.058*
		(0.032)	(0.032)		(0.032)	(0.032)
Both private and public insurance		0.065*	0.066*		0.065*	0.068*
		(0.035)	(0.036)		(0.037)	(0.037)
Excellent or very good physical health		0.095**	0.095**		0.056**	0.055**
		(0.019)	(0.019)		(0.022)	(0.022)
Excellent or very good mental health		0.104**	0.103**		0.105**	0.105**
		(0.025)	(0.025)		(0.024)	(0.024)
Observations	11294	11294	11294	11310	11310	11310

Notes: Standard errors in parentheses.
** Statistically significant at the 0.05 level and 0.01 level. * Statistically significant at the 0.1 level
Adjusted for year fixed effects, MSA status, place of residence, and employment status.

Table 3.3: Determinants of Patient Satisfaction

	Doctor Showed Respect			Doctor Spent Enough Time		
Non-Hispanic white women	-0.008	-0.007	0.044	-0.023*	-0.025*	0.023
	(0.012)	(0.012)	(0.042)	(0.013)	(0.013)	(0.049)
Hispanic men	-0.038	0.018	0.145**	-0.130**	-0.074**	-0.026
	(0.025)	(0.028)	(0.047)	(0.028)	(0.033)	(0.071)
Hispanic women	-0.019	0.041*	0.138**	-0.072**	-0.012	0.068
	(0.022)	(0.025)	(0.036)	(0.021)	(0.024)	(0.046)
Racial Concordant white women			0.065**			0.055**
			(0.029)			(0.027)
Racial Concordant white men			0.075**			0.120**
			(0.032)			(0.034)
Racial Concordant Hispanic men			-0.047			-0.057
			(0.040)			(0.048)
Racial Concordant Hispanic women			-0.005			0.029
			(0.040)			(0.038)
Gender Concordant white women			-0.018			-0.023
			(0.020)			(0.020)
Gender Concordant white men			0.043*			-0.022
			(0.025)			(0.027)
Gender Concordant Hispanic men			-0.041			0.072
			(0.051)			(0.062)
Gender Concordant Hispanic women			-0.031			-0.009
			(0.038)			(0.033)
Proportion of life lived in US		0.147**	0.142**		0.194**	0.192**
		(0.042)	(0.043)		(0.047)	(0.048)
Interview in English		-0.012	-0.016		-0.010	-0.009
		(0.034)	(0.033)		(0.037)	(0.038)
Age 35-49		0.016	0.019		0.017	0.018
		(0.021)	(0.021)		(0.020)	(0.020)
Age 50-64		0.041**	0.042**		0.047**	0.048**
		(0.020)	(0.021)		(0.020)	(0.021)
Married		0.008	0.005		0.041*	0.038*
		(0.020)	(0.020)		(0.021)	(0.021)
Widowed/Divorced/Separated		0.014	0.011		0.056**	0.054**
		(0.023)	(0.022)		(0.022)	(0.022)
Middle income		0.003	0.001		-0.011	-0.012
		(0.017)	(0.017)		(0.020)	(0.020)
High income		0.043**	0.042**		0.026	0.025
		(0.017)	(0.017)		(0.021)	(0.022)
High school or GED		-0.011	-0.011		-0.023	-0.023
		(0.024)	(0.024)		(0.026)	(0.026)
More than high school		0.006	0.004		-0.028	-0.030
		(0.023)	(0.023)		(0.027)	(0.027)
Private insurance		0.070**	0.071**		0.070**	0.072**
		(0.022)	(0.022)		(0.026)	(0.026)
Public insurance		0.076**	0.079**		0.055*	0.058*
		(0.029)	(0.029)		(0.031)	(0.031)
Both private and public insurance		0.078**	0.080**		0.083**	0.087**
		(0.039)	(0.039)		(0.042)	(0.042)
Excellent or very good physical health		0.068**	0.068**		0.097**	0.095**
		(0.021)	(0.021)		(0.023)	(0.022)
Excellent or very good mental health		0.114**	0.113**		0.083**	0.083**
		(0.024)	(0.024)		(0.025)	(0.025)
Observations	11319	11319	11319	11270	11270	11270

Notes: Standard errors in parentheses.
** Statistically significant at the 0.05 level and 0.01 level. * Statistically significant at the 0.1 level
Adjusted for year fixed effects, MSA status, place of residence, and employment status.

Table 3.4: Patient Satisfaction by Age

	Doctor Listened			Doctor Explained so Understood		
	Age 18-34	Age 35-49	Age 50-64	Age 18-34	Age 35-49	Age 50-64
Non-Hispanic white women	-0.122	-0.055	-0.026	0.075	0.072	0.076
	(0.100)	(0.075)	(0.056)	(0.089)	(0.090)	(0.056)
Hispanic men	-0.173	0.095	-0.125	0.154	0.144	-0.046
	(0.135)	(0.099)	(0.096)	(0.095)	(0.107)	(0.091)
Hispanic women	0.009	0.025	0.031	0.211**	0.167**	0.067
	(0.092)	(0.071)	(0.065)	(0.075)	(0.071)	(0.065)
Racial Concordant white women	0.122**	0.102**	0.033	0.110*	0.086*	0.019
	(0.058)	(0.049)	(0.040)	(0.065)	(0.046)	(0.038)
Racial Concordant white men	0.040	0.034	0.057	0.253**	0.090	0.110**
	(0.073)	(0.053)	(0.039)	(0.070)	(0.063)	(0.045)
Racial Concordant Hispanic men	-0.059	-0.131*	-0.126*	-0.186**	-0.109	-0.054
	(0.090)	(0.071)	(0.071)	(0.092)	(0.068)	(0.076)
Racial Concordant Hispanic women	0.002	-0.019	0.108*	-0.089	-0.029	0.111**
	(0.061)	(0.068)	(0.056)	(0.082)	(0.061)	(0.055)
Gender Concordant white women	-0.004	-0.040	0.003	0.011	-0.026	-0.041
	(0.044)	(0.034)	(0.026)	(0.047)	(0.034)	(0.027)
Gender Concordant white men	-0.040	-0.019	0.011	-0.023	0.000	-0.003
	(0.063)	(0.046)	(0.033)	(0.059)	(0.049)	(0.035)
Gender Concordant Hispanic men	0.209**	-0.028	0.165*	0.069	0.007	0.111
	(0.095)	(0.094)	(0.088)	(0.098)	(0.103)	(0.081)
Gender Concordant Hispanic women	-0.033	0.061	-0.075	-0.034	-0.034	-0.077
	(0.064)	(0.059)	(0.061)	(0.083)	(0.048)	(0.069)
Observations	3226	3399	4663	3226	3389	4657
	Doctor Showed Respect			Doctor Spent Enough Time		
	Age 18-34	Age 35-49	Age 50-64	Age 18-34	Age 35-49	Age 50-64
Non-Hispanic white women	-0.152	0.076	0.089*	-0.072	0.062	0.033
	(0.094)	(0.080)	(0.048)	(0.096)	(0.090)	(0.064)
Hispanic men	0.019	0.144	0.162**	-0.112	0.041	-0.069
	(0.129)	(0.091)	(0.059)	(0.117)	(0.138)	(0.100)
Hispanic women	0.047	0.132**	0.147**	-0.050	0.155*	0.039
	(0.092)	(0.064)	(0.047)	(0.087)	(0.080)	(0.073)
Racial Concordant white women	0.143**	0.016	0.058	0.055	0.086*	0.033
	(0.061)	(0.044)	(0.036)	(0.064)	(0.048)	(0.042)
Racial Concordant white men	0.008	0.047	0.115**	0.133*	0.134*	0.109**
	(0.068)	(0.064)	(0.041)	(0.069)	(0.070)	(0.047)
Racial Concordant Hispanic men	0.040	-0.119*	-0.012	-0.142	-0.046	-0.003
	(0.099)	(0.065)	(0.068)	(0.102)	(0.070)	(0.079)
Racial Concordant Hispanic women	-0.066	-0.087	0.133**	0.027	-0.047	0.123**
	(0.082)	(0.066)	(0.059)	(0.065)	(0.059)	(0.057)
Gender Concordant white women	-0.005	-0.011	-0.030	-0.067	-0.040	0.007
	(0.044)	(0.031)	(0.027)	(0.048)	(0.031)	(0.027)
Gender Concordant white men	-0.049	0.020	0.070*	-0.137**	-0.025	0.006
	(0.056)	(0.045)	(0.037)	(0.052)	(0.048)	(0.038)
Gender Concordant Hispanic men	-0.025	-0.029	-0.028	0.069	0.048	0.110
	(0.107)	(0.093)	(0.078)	(0.110)	(0.111)	(0.094)
Gender Concordant Hispanic women	-0.093	-0.013	0.026	0.057	-0.017	-0.052
	(0.078)	(0.061)	(0.068)	(0.060)	(0.053)	(0.065)
Observations	3221	3388	4658	3223	3388	4653

Chapter 4: The impact of Gender Roles on Child Nutrition in Turkey: A Principal Component Analysis

4.1 Introduction

Inadequate dietary intake, infection and acute illness, lack of health services, and socioeconomic status are some of the underlying factors driving the incidence of malnutrition throughout the world. It is widely acknowledged by agencies such as the World Health Organization (WHO) that important interventions to combat malnutrition in children include improving sanitation, increasing the availability of health services, promoting immunization, and eliminating poverty (WHO). However, improving the material conditions of families may not be enough; how families understand appropriate feeding practices and how cultural norms affect those practices appear to be important as well (as Griffiths *et al.* (2002) found for Nepal). Studies have shown that families who do not regularly experience food insecurity can still have malnourished children (as 2001 National Nutrition Monitoring Bureau found in India), raising questions regarding other related factors associated with nutrition and health.

Studies have found that aspects of both a mother's social condition and health interact with her child's nutritional intake, nutritional status, and health in ways we are just beginning to explore (Ramalingaswami *et al.*, 1996; Smith *et al.*, 2003). Beyond being informed of best feeding practices, Shroff *et al.* (2011) suggest that without the ability to exercise agency through decision making and self-determination, even a woman with adequate knowledge and food resources may be unable to benefit her children in ways that improve their nutrition and health (Shroff *et al.*, 2011). Furthermore, women who face restrictions imposed upon them by others may not only experience negative health consequences, but they may also pass them on to their children in the form of low birth weight, poor nutrition, and low quality of care (Kishor, 2000; Bhagowalia, 2010). Although

there is extant literature that attempts to define and measure women's autonomy, very little has been done to explore how a woman's autonomy may be influencing the health of her children through such measures as nutritional status and growth (Dancer and Rammohan, 2009; Shroff *et al.*, 2011).

Situated between Europe and the Middle East, Turkey provides a unique opportunity study the impact of women's autonomy on children's health outcomes for several reasons. First, Turkey provides a special case because, even though rates of stunting in children have fallen significantly in the last fifteen years, one in ten children still suffer from stunted growth (TDHS, 2008). Next, there are trends in changing social norms and women's empowerment that may enable women to exert more control over their lives (Oguz, 2014). However, traditional beliefs concerning childrearing still bind a woman tightly to the physical care of her children. For instance, a large proportion of women in Turkey (72 percent) (TUIK, 2011) do not work outside the home, and one of the common reasons given for not working is the expectation of caregiving. Therefore, the goals of this study are to contribute to understanding how to reduce the rate of stunting in children even further while at the same time exploring some of the possible effects of increases in autonomy for women in Turkey.

While there are studies that explore the determinants of children's nutrition status in Turkey (Ergin *et al.*, 2007; Yigit *et al.*, 2010), the impact of women's autonomy has been overlooked in the empirical analyses. In order to address this gap in the literature, I investigate links between a mother's autonomy and her children's health outcomes. My hypothesis is that a woman's non-conformity to traditional gender roles and her higher level of autonomy may positively impact child nutrition status and growth.

To explore this hypothesis, I used the 2008 Turkish Demographic and Health Survey (TDHS). TDHS has rich variety of gender norm variables that allow me to assess the level of a mother's conformance to traditional gender roles and levels of autonomy. However, I find that these autonomy variables are highly correlated with each other. To overcome this redundancy I used the Principal Component Analysis method. This method allowed me to determine the principle components that represent the most relevant gender roles and autonomy variables while retaining the most variation in the data set.

I find that woman's autonomy is positively associated with her children's nutritional status and has long-term consequences on her child's nutritional status. For instance, I found that mothers with lack of autonomy are more likely to exercise a nutritional discrimination in favor of male children. Furthermore, I find that the degree to which a mother is able to exercise autonomy in the household is more important for female child nutritional status than her level of education. In addition, I find that female children fare better in terms of nutritional status when they are raised in households with more highly educated fathers. Overall, my findings indicate that there is room to improve childhood health outcomes in Turkey, and therefore a child's life chances, with policies that support women's autonomy and investments in education, particularly for men.

4.2 Definition and Measurement of Women's Autonomy

Women's empowerment, status, and autonomy are all related concepts used interchangeably in the literature. In general, all of these terms refer to "a woman's ability to have control or influence over choices that affect herself and her family within her own particular context" (Carlson *et al.*, 2013, page 1). This definition describes a woman's ability to define her goals and act upon them, also as known as agency (Kabeer, 1999). There has

been some effort in the literature to distinguish these terms based on the scope of a woman's agency; i.e agency at the household level refers to autonomy and agency at the broader societal level refers to empowerment (Carlson *et al.*, 2013). In addition, a woman's status refers to how she is perceived in society (Shroff, 2007).

Studies also point out that autonomy is a multi-dimensional concept (Shroff, 2007). For instance, Jejeebhoy (1997) suggest that autonomy has five dimensions: knowledge autonomy (i.e. exposure to information), decision-making autonomy (i.e. ability to make household decisions), physical autonomy (i.e. degree of social mobility), emotional autonomy (i.e. her self-esteem) and economic autonomy (i.e. ability to make business decisions).

Studies rely on survey data such as Demographics and Heath Surveys (DHS) to measure the level of a woman's autonomy in a given country. For instance, DHS has a series of questions regarding a woman's self-esteem, household-decision making ability, opinion regarding domestic violence, and social mobility, etc., all of which help researcher make direct interferences regarding her autonomy. In some cases, researchers use indirect measures of autonomy, such as age at first marriage, education, presence of mother-in-law, and spousal age difference (Shroff, 2007; Lepine and Strobl; 2012). In addition, one practice of quantifying a woman's autonomy is creating a composite index from various survey questions (Upadhyay and Karasek, 2010; Varghese, 2011; Haque *et al.*, 2011); however, this approach ignores the multidimensionality of autonomy and confounds the differential impact of each dimension (Lepine and Strobl, 2012; Carlson *et al.*, 2013).

4.3 Anthropometric measures

Anthropometric measures are commonly used indices to assess the adequacy of diet and growth for children. Although available weight and height information in survey data is important, those measures alone are not good indicators of malnutrition and need to be translated to standardized measures to allow identification of which children (or which populations) are at risk for malnutrition (WHO). According to the WHO, anthropometric measures are calculated as the deviations of actual height and weight measurements from the corresponding age and sex specific median values in the internationally accepted reference population (i.e. National Center for Health Statistics and World Health Organization growth references) (Food and Agriculture Organization of the United Nation). These populations provide reference points and allow for comparisons, and they are based on the assumption that young children from all populations who are well nourished are similar in terms of their growth before puberty (TDHS 2008, page 177). Distributions of anthropometric indices follow normal distribution, and children who fall two or more standard deviations below the mean of the distribution are considered to be at high risk for malnutrition (Food and Agriculture Organization of the United Nation; WHO).

Height-for-age is the most commonly used indicator of the nutritional status of children in developing countries. According to the WHO, the height-for-age index reflects long-term measurements of nutritional status, allowing us to capture chronic nutritional deficiency and/or chronic illnesses (WHO). Departures from normal growth patterns occur in children who have height-for-age scores below the minus two standard deviations and are referred to as stunted (short) for their age and sex. If this measure is below the minus three standard deviations the children are referred to as extremely stunted (extremely short) for their age and sex (WHO).

The weight-for-height index reflects short term changes in nutritional status and measures body weight relative to height. This measure captures sudden health shocks (acute conditions) such as diarrhea (WHO). The children who have weight-for-height scores below the minus two standard deviations are referred as thin. If this measure is below the minus three standard deviations they are referred to as wasted.

Weight-for-age is a composite measure of height-for-age and weight-for-height measures which captures both chronic (long-term) and acute (short-term) conditions (WHO). This measure is hard to interpret since underlying causes of the problem (i.e. long-term or short-term effects) are not clear. The children who have weight-for-age scores below the minus two standard deviations are referred to as underweight. If this measure is below the minus three standard deviations they are referred to as extremely underweight.

4.4 Links between Women's Autonomy and Child Health

Studies on child welfare in developing countries have found evidence of the importance of a woman's autonomy on child health outcomes; however, it should be noted that these studies define and measure women's autonomy differently, and the magnitude of the impact of autonomy changes based on which measures a particular study relied upon (Carlson *et al.*, 2013).

Smith *et al.* (2003) suggest that the more control a woman has over financial (i.e. income) resources, the more effective her care for herself and her children will be. Studies have demonstrated that the more financial autonomy a woman has the more likely she will devote financial resources to the benefit of her children, such as a more appropriate and timely diet, more education, and effective utilization of health care services (Quisumbing and Maluccio, 2000; Quisumbing and Maluccio, 2003). Financial autonomy is measured several

ways in the literature: management of or control over family assets (Allendorf, 2007; Ross-Suits, 2010), employment with cash earning (Begin *et al.*, 1999; Sethuraman *et al.*, 2006; Bhagowalia *et al.*, 2010), ability to set aside money (Shroff *et al.*, 2009; Shroff *et al.*, 2011), and household decision making for daily and large household purchases (Dancer and Rammohan, 2009; Ross-Suits, 2010).

However these studies find mixed evidence as to whether a woman's financial autonomy can be translated into better health for her children. For instance, Allendorf (2007), found that a mother's financial autonomy reduced the probability of having an underweight child. In addition, Shroff *et al.* (2009), using 1998-99 Indian National Family Health Surveys, found that a woman's financial autonomy, measured by the ability to set aside money, reduces the likelihood of her children being stunted. In another study, Shroff *et al.* (2011) surveyed 600 mothers from rural Andrha Pradesh, India between 2005 and 2006. In this study, the authors framed financial autonomy questions, such as whether she can set aside money to use for her own discretion (i.e. to purchase jewelry), differently. Using this different measure the authors didn't find significant impact of financial autonomy on stunting (or any other anthropometric score). Furthermore, Sethuraman *et al.* (2006) measured financial autonomy as whether a woman is employed and earns cash income; however, they didn't find a significant impact of financial autonomy on children's weight-for-age. These mixed results suggest that the impact of financial autonomy is context specific, and its impact depends on how it is measured.

In developing countries women can face social norm constraints in accessing health care for herself and her children, which may prevent receiving timely treatment during periods of illness. Studies use health care autonomy to capture the degree to which a woman

is restricted in terms of healthcare seeking behavior (Kishor, 2000). For instance, health care autonomy can be measured as whether the mother has final say in decisions regarding her own health care (Desai and Johnson, 2005; Ross Suits, 2010), whether the mother was the one to decide to immunize the infant (Shroff *et al.*, 2011), whether the mother can take children to a health facility without her partner's permission and/or without any accompanying person, and preference for female physician (Mashal *et al.*, 2008). Studies found that a mother's improved health care autonomy improves the nutritional status of children: particularly their height-for-age scores (Desai and Johnson, 2005; Mashal *et al.*, 2008; Ross Suits, 2010; Shroff *et al.*, 2011). Health care autonomy's strongest impact on height-for-age z-scores indicate its long term impact on the nutritional status of children through channels such as better management of medical care resources during periods of illness and even the prevention of disease (Carlson *et al.*, 2013).

According to Carlson et al. (2013), mobility autonomy captures a woman's degree of social freedom such as ability to travel or visit her family and friends independently and without permission. Women with more autonomy over mobility are expected to engage in more social interactions outside her household, rely on her social support to gather information regarding health-care and feeding practices, and visit healthcare providers in a timely way, all behaviors which may lead to improved nutritional status for their children (Smith *et al.*, 2003).

Studies measure mobility autonomy by the ability to go to the market (Shroff *et al.*, 2009), go places without permission (Shroff *et al.*, 2009; Shroff *et al.*, 2011) in the village (Sethuramn *et al.*, 2006), to go out alone or with children to the health center or other places (Bhagowalia *et al.*, 2010), or to visit family and friends (Basu and Koolwal, 2005; Shroff *et*

al., 2009). Some of these studies find a positive association between the increased mobility autonomy of a mother and a reduced likelihood of stunting (Shroff *et al.*, 2009), improved weight-for-age (Sethuramn *et al.*, 2006) and height-for-age scores (Shroff *et al.*, 2011) for her children. However, other studies didn't reveal a significant impact of the mobility autonomy measure on child health outcomes. For instance, Bhagowalia *et al.* (2010), using the 2007 Bangladesh Demographic and Health Survey, didn't find a significant impact of mobility autonomy of a mother on either stunting or on diet diversity. Furthermore, Basu and Koolwal (2005), using the 1998-99 India National Family Health Survey, found that mobility autonomy increases the mother's access to medical care during her pregnancy, but it doesn't have an immediate impact on her children's health outcomes as measured by whether a child has anemia or not.

Domestic violence in the form of physical, emotional, or sexual violence can reduce the level of a woman's autonomy in the household and result in reduced mobility and greater restrictions in her choices and freedom including food decisions which may impair her own and her children's health and nutrition (Sethuranaman, 2008; Bhagolowia *et al.*, 2012; Carlson *et al.*, 2013).

Sobkoviak *et al.* (2012), using 2007 Liberia Demographics and Health Survey, found that children are more likely to be underweight and stunted if their mother reports that she had experienced sexual violence. Similarly, Sethuranaman (2008) surveyed 820 mothers of children aged 6 to 24 months in Karnakada India between 1998 and 2000 and found that children fare worse in terms of weight-for-age scores if their mother had experienced domestic violence, especially in the form of sexual coercion. However, Shroff *et al.* (2011) didn't find such an impact on child health outcomes.

A woman's attitude toward domestic violence is measured by whether a woman justifies beating for various conditions such as if she neglects children, argues with her husband, refuses sex, goes out without permission, shows disrespect for in-laws, or if her husband suspects of her being unfaithful (Basu and Koolwal 2005; Shroff *et al.*, 2009; Ross-Suits, 2010; Shroff *et al.*, 2011; Pandey and Lee, 2011; Bhagolowia *et al.*, 2012). Basu and Koolwal (2005) found a significant impact of attitude towards domestic violence on children's probability of having anemia. Furthermore, Ackerson and Subramanian (2008), using 1998-99 Indian National and Health Survey, and Bhagolowia *et al.* (2012), using 2007 Bangladesh Demographic and Health Survey, found that children raised by women who justify physical violence are more likely to be stunted. In contrast, other studies didn't find significance of attitude towards domestic violence on the probability of a child being stunted (Shroff *et al.*, 2009) or wasted or underweight (Ross-Suits, 2010), the probability of being immunized (Pandey and Lee, 2011), or child nutritional status (Shroff *et al.*, 2011).

A mother's participation in household decision-making and ability to change household resource allocation is another dimension of autonomy frequently investigated in the children's nutritional status literature. The significant and positive impact of decision-making autonomy on the nutritional status of children is highly evident in the literature. In particular, children living in poor households where resources such as food and other essentials are limited fare much better when their mother's decision-making autonomy is higher (Smith *et al.*, 2003).

Begum (2005), using the 2000 Bangladesh Demographic and Health Survey, and Lepine and Strobl (2013), using the 2005 Senegal Demographic and Health Survey, found that greater involvement in decision making is positively associated with all three

anthropometric measures used for nutritional status. Similarly, Desai and Johnson (2005) found that, in India, increased decision-making autonomy in mothers increases the height-for-age scores and probability of having a complete immunization status for her children. Dancer and Rammohan (2009) and Sethuraman *et al.* (2006) found a positive impact of decision making autonomy on children's weight-for-age model. In addition, Bhagolowia *et al.* (2012) found that a mother's increased decision-making autonomy reduces the likelihood of her children being stunted.

Chakraborty and Anderson (2011), using the 2005-06 India's National Family Health Survey, found that low maternal decision-making autonomy is highly associated with low birth outcomes, even after controlling for socioeconomic characteristics. Furthermore, Sharma and Kader (2013), using the Maternal and Infant Nutritional Intervention in MINIMat-study in Bangladesh, created a composite index[22] for decision making autonomy and found that women with the lowest decision-making autonomy are more likely to have children with low birth weights.

4.5 Theoretical Model

I use the household production function proposed by Rosenzweig and Schultz (1983), Pitt and Rosenzweig (1985), and Bhagowalia *et al.* (2010) to examine the impact of a mother's autonomy on her children's nutritional status. This model provides a framework from which to explore how parents make choices about how to invest in the health of their children, i.e. similar to Becker's (1981) household utility maximization model. In this model

[22] The authors developed a scale for measuring decision making autonomy, assigning 3 points for each of the household decisions made by women, 2 points for each decision in which women can participate, and 1 point if a woman doesn't have a say in decision making. Women who scored 15 and above are considered as having the highest autonomy and those women who scored 12 and below were considered as having low autonomy.

the family does not maximize child health, but looks at child health as one utility-augmenting "good" for which it must sacrifice other goods (Rosenzweig and Schultz, 1983 page 55).

Therefore, household utility can be derived from the consumption of health neutral goods and services (C) (which has no effect on health status), consumption of goods or behaviors which do have an impact on health (Z) (for instance exercising and smoking), leisure (L) and good child health (H):

$$U = u(C, Z, L, H)$$

H reflects a child health production function, similar to the health production function described in Rosenzweig and Schultz (1983), Pitt and Rosenzweig (1985), and Behrman and Deolikar (1988):

$$H = h(\ N, Y, M, G, x, \mu)$$

In these models, households produce health for their children through investments in their nutritional intake (N) and medical inputs (Y) such as utilizing antenatal care during pregnancy. The provision of healthier environment leads to better health outcomes, and children are no exception. Therefore, household characteristics (G) such as access to health services and the availability of safe water and sanitation facilities all produce a child's health. I also include parent's characteristics (P) (such as mother's education and autonomy[23]) to reflect their efficiency in the production of their children's health. In addition, x is a vector of observable child characteristics such as age and sex. Unobserved characteristics influencing health, such as genetic traits or environmental factors, which the household has no control

[23] Behrman and Deolalikar and Wolfe (1988) suggest that women endowments such as her ability, motivation and knowledge needs to be enter into reduced-form demand function, otherwise the impact of a woman's schooling on child health will be overestimated. Therefore, following Bhagowalia *et al.* (2010), I included maternal characteristics in the production of child health function.

over are characterized as a vector of technology parameters μ. In addition, household budget constraint takes the form of:

$$I = p_c C + wL + p_z Z + p_y Y$$

where $p_c, w, p_z,$ and p_y are the prices of health neutral goods and services, leisure, health related goods and services, and health inputs respectively. The reduced form of the child health production function can be found from the household maximization of the utility function subject to budget constraint (I) and the health production function (H). Reduced form demand for child health is:

$$H = h(p_c, p_z, p_y, I, x, M, G, \mu)$$

which depends on observable characteristics such as prices ((p_c, p_z, p_y)), maternal characteristics (M), child characteristics (x), household characteristics (G), and unobserved characteristics such as genetic traits or environmental factors (μ). The reduced form demand for child health indicates that changes in prices will affect child health; however, lack of this kind of data forces me to use only socioeconomic inputs that are related to child health production.

The empirical work that follows is generally guided by the above economic model. In this study, I measure child health through three indicators: anthropometric measures (nutritional status), birthweight, and incidence of having had diarrhea during the two weeks prior to the survey. Relying on the available socioeconomic data, I model child health production in general form as follows:

$$H_{nutritionalstatus} = F(Age_m, Ageatfirstbirth_m, Educ._m, Autonomy_m, BMI_m, Educ._{f,}$$
$$Region_{h,} Ethnicity_h, Wealth_h, Age_c, birthweight_c)$$

$$H_{diarrhea} = F(Age_m, Ageatfirstbirth_m, Educ._m, Autonomy_m, BMI_m, Educ._{f,}$$

$$Region_{h,}Ethnicity_h, Wealth_h, Age_c, birthweight_c)$$

$$H_{birthweight} = F(Age_m, Ageatfirstbirth_m, Educ._m, Autonomy_m, BMI_m, Educ._{f,}$$

$$Region_{h,}Ethnicity_h, Wealth_h, Antenatalcare_m, Smoking_m)$$

where m, f, c, and h refer to the mother, father, child, and household respectively. In the next section I present the economic intuition behind the choice of variables producing health for children and review the related empirical findings.

4.5.1 Maternal Characteristics

In the economic model above, more highly educated parents are more efficient producers of child health, providing utility, where efficiency is defined as greater output (in this case better health) from the given inputs (Rosenzweig and Schultz, 1983 page 59). It is expected that more educated and empowered mothers are more likely to acquire health knowledge, control financial and non-financial resources (including her time), and effectively transform these resources into better health for her children. Empirical findings support this economic intuition. For instance, studies find that a mother's education has a strong and positive impact on her children's nutritional status, especially in height-for-age scores (Smith *et al.*, 2003; Dancer and Rammohan, 2009; Imai *et al.*, 2014). Smith *et al.* (2003) found an even stronger effect of a father's education on his children's nutritional status. Similarly, Ergin *et al.* (2007) found that, especially in areas with low rates of maternal employment, paternal education has a strong impact on child nutritional status.

In addition, based on the economic model above, employed women invest less of their time into the production of their child's health because their opportunity cost of time is larger. They are expected to spend less time on the production of their child's health, and to be more likely to invest in medical inputs. Empirical findings of the impact of maternal

employment on child health outcomes are ambiguous. Studies have found a positive impact (Dancer and Rammohan, 2009; Morrissey *et al.*, 2011), a negative impact (Sethuraman *et al.*, 2006), or no impact (Shroff *et al.*, 2011) of employment on child health outcomes. Maternal employment improves a mother's decision making ability in the household and improves the financial status of the family, which may translate into better nutritional intake for her children. However, employed mothers also face time constraints in taking care of her children, which may increase the risk of malnutrition (Girma and Genebo, 2002), especially for children living in poor households with limited childcare arrangements (Sethuraman *et al.*, 2006).

Mother's age at first birth refers to the point in her life cycle at which she chooses to have child. A mother's age reflects her life experiences, and older mothers are expected to have greater knowledge regarding the importance of a balanced diet and which foods are high in nutrition. The empirical findings show weak support on the effectiveness of child health production for older mothers. For instance, Smith *et al.* (2003), using data from 36 Demographic and Health Surveys between 1990 and 1998, found that a mother's age is positively correlated with her children's nutritional status. However, Ergin *et al.* (2007), surveying 1,400 children and their mothers in a western city (Aydin) in Turkey didn't find an impact of a mother's age on child nutritional status.

A mother's behaviors may provide her with utility, but at the same time, as is the case with smoking, they may have an impact on child health outcomes, especially on children's birth weight. Studies consistently find that a mother's smoking behavior during pregnancy is associated with adverse health outcomes for babies (Ting-Jung *et al.*, 2014). Caloric intake and dietary adequacy (proxied by her BMI in this study) also influence how nutrients are

shared between the mother and the fetus during the pregnancy. Research supports the intergenerational link of nutrition between mother and child. For instance, several studies show that a mother's nutrition may have important mediating impact on child health outcomes, especially on nutritional status (Sethuraman *et al.*, 2006; Dancer and Rammohan, 2009; Shroff *et al.*, 2011; Halim, 2011).

Antenatal care is important to identify maternal complications and educate expectant mothers regarding healthy behaviors, including the importance of breastfeeding (Halim, 2011). According to the economic model above, a mother seeks antenatal care for the sake of enhancing her child's health and preventing adverse health conditions to avoid future disutility. According to Habibov (2011), the positive impact of antenatal care on birth weight varies in magnitude depending on the socio-economic conditions of the country and features of the health care system.

4.5.2 Household Characteristics

In this model household characteristics include where a family resides, which has influence on the quality and quantity of health and medical inputs. For instance, access to safe drinking water may affect a child's susceptibility to illness. There are substantial social and cultural differences between regions and urban and rural areas in Turkey. The West and North regions are the most modern (the social norms and values are less strict), the East is the least modern (persistent social norms), and Central and South regions occupy the intermediate positions (Srikantan, 1973). This pattern holds for economic opportunities, availability of health centers, and other infrastructure; therefore, I expect that children living in the West region and in urban areas will have better health outcomes than children living in the East region and in rural areas. Empirical findings show that there are urban-rural and

regional differences in child health outcomes (Smith *et al.*, 2003; Yigit *et al.*, 2010). For instance, Ergin *et al.* (2007) found that the prevalence of stunting was significantly larger in rural areas than urban areas in Turkey.

In addition, differences in health based on ethnicity may arise due to differences in demand for health inputs between groups, and each group's genetic traits may contribute to variation in responses to the same health inputs (Rosenzweig and Schultz, 1983). There are two main ethnicities living in Turkey: Turkish and Kurdish. Kurds comprise about 20 percent of Turkey's population. They mostly reside in the West and Eastern parts of Turkey, and they are more likely to have a poor socio-economic environment, including low educational attainment, income, and access to health care and other state services (Icduygu, Romano, and Sirkeci, 1999). Therefore, including the ethnicity of children in this analysis is both theoretically and empirically viable, and Kurdish children are expected to have lower levels of health compared to Turkish children.

The level of available resources determines the capability of families to purchase health services and nutrition health inputs that produce health. In the "unitary" household production models, theoretically, this would imply that household members pool their resources and equally allocate their resources. However, according to Rosenzweig and Schultz (1982), intra-family resource allocation can be responsive to market signals. For instance, parents in developing countries may treat boys more favorably than girls (i.e allocate more family resources) due to the higher future earning potentials expected of boys. In more traditional families, girls may be seen as investments with little possibility of return since when she gets married she will no longer provide financial or non-financial benefits to her family. Therefore more traditional families may discriminate against girls in their

resource allocation. Empirically, household economic status in developing countries is usually measured by a wealth index (as an indicator of food security and overall quality of living) due to lack of income data in Demographics and Health Surveys. Dancer and Rammohan (2009), using the Nepal Demographic and Health Survey, found empirical support for referencing boys in family resource allocation. For instance, the authors found that families with a higher wealth status have better nutritional status for the children, and the impact was larger for boys.

4.5.3 Child Characteristics

Relatively few studies have looked at gender differentials in child health outcomes. These differentials may be due to the preference for boys in resource and time allocation (as mentioned above). The majority of empirical findings support this economic intuition. For instance, Sharma (2003), using the 1998-99 National Family Health Survey, found that girls have systematically lower nutritional status whether the family is rich or poor. Similarly, Dancer and Rammohan, using the 2001 Nepal Demographics and Health Surveys, found large gender differentials in the nutritional status of children under 3 years of age, especially for weight-for age z-scores.

As children age they undergo a variety of developmental changes, and their nutritional needs change. Some studies show that the possibility of malnutrition increases as children grow older (Dancer and Rammohan, 2009; Halim, 2010). In addition, birth order and short birth intervals could adversely affect child health outcomes, since additional births closely spaced places higher financial and non-financial constraints on household resources. For instance, a child's place in the birth order dictates what constraints on food consumption and parental attention they face, while shorter birth intervals may cause maternal nutritional

depletion and shorter periods of lactation. Some studies have found an association between a child's birth order and their probability of suffering from malnutrition (Girma and Genebo, 2002; Borooah, 2005). However, empirical findings on the impact of longer birth intervals on nutritional outcomes are ambiguous (Dewey and Cohen, 2007). For instance, Girma and Genebo (2002) found that the probability of stunting for children in Ethiopia is highest for those children whose preceding birth interval was less than 24 months. In contrast, Boerma and Bicego (1992) found no increase in the probability of stunting for children in the Dominican Republic whose preceding birth interval was less than 24 months.

4.6 Review of the Literature

In light of the economic model described above, I explore the factors that produce child health in Turkey with an emphasis on the impact of maternal autonomy. Each of the studies reviewed here measure autonomy in different dimensions and are context specific. This requires using measures derived from the Turkish Demographic Health Survey specifically to explore the impact of women's autonomy on child nutritional status within Turkey, as the previous findings are not generalizable to other locales. And rather than creating a composite index and/or ranking autonomy in terms of degree (low, medium, or high), I consider each dimension of autonomy available in the survey separately, thereby avoiding the confounding of the consequences that results from such an approach. I therefore hypothesize that:

H1: Increased mother's autonomy in Turkey improves the nutritional status of her children.

H2: Increased mother's autonomy in Turkey improves the birth weights of her children.

H3: Increased mother's autonomy in Turkey reduces the likelihood of her children having had diarrhea in the two weeks prior to the survey.

H4: The impact of her autonomy on her children may be subject to gender bias.

In order to explore these hypotheses, I create dimensions of autonomy based on a principal component analysis, since combining all of the autonomy variables at the same time reduces the explanatory power of each. In addition, previous studies focused mainly on the nutritional status of children when exploring the impact of women's autonomy on child health outcomes. Only a few studies have explored the impact of women's autonomy on other child health outcomes such as birth weight and susceptibility to diarrhea.[24] Therefore, I rely on five measures of child nutritional status: weight-for-age, height-for-age, weight-for-height, whether or not a child has had diarrhea within the two weeks prior to the survey, and birth weight to ensure capturing the influence of women's autonomy comprehensively.

As previously mentioned, considering that more traditional families may distribute resources (including nutrition) to boys and girls differently based on the child's potential to make future contributions (Griffiths *et al*., 2002), I will test whether or not children in Turkey are subject to this gender bias.

Previous studies have frequently employed the Ordinary Least Squares method (OLS) when measuring nutritional status as a continuous outcome variable and/or converted nutritional status and birthweight into a binary outcome variable (where 1 is stunted or underweight) in order to estimate the probability of having a low health status. I employ the OLS model for nutritional status and birth weight outcomes and the Probit model to estimate the probability of having had diarrhea.

4.7 Data

Data for this analysis comes from the 2008 Turkish Demographics and Health Survey (TDHS). The TDHS provides nationally representative data about fertility, mortality, marriage and family planning, maternal and child health, and the nutritional status of children

[24] Episodes of diarrhea in children can be considered a health shock and may cause nutritional depletion.

under the age of five (TDHS, 2008). The total number of respondents in the ever-married women section of the DHS is 7,405; after excluding women who didn't have children under five years of age, and those with children without height and weight information, I am left with a sample size of 2,733 children.

4.7.1 Outcome Variables

I measure the health and nutritional status of children under five years old by five dependent variables: height -for-age score, weight-for-age score, weight-for-age score, birth weight and whether the child have had diarrhea during the last two weeks. Height (cm) and weight (gr) measures are collected for under-five children on-site by a trained interviewer.

The TDHS compares the nutritional status of children in this survey population to U.S. National Center for Health Statistics and World Health Organization Child Growth Standards, and reports their corresponding z-scores. For instance, height-for-age measure can be calculated by taking U.S. standards as a reference

$$HTA = \frac{X_{it} - X_{Mt}}{\sigma_{Mt}}$$

where X_{it} is the height of the ith child at age t (in months), X_{Mt} is the median height, and σ_{Mt} is the standard deviation of height for children at age t in the reference U.S. standards. I made use of z-scores calculated by TDHS taking the U.S. as reference population.

In addition, the TDHS reports the birth weights of children under five based on a written health record if available, otherwise from the mother's recall. I coded birth weight as a continuous variable and exclude "not weighted at birth" and "don't know" responses. Finally, the TDHS reports whether under-five children had experienced diarrhea during the two weeks prior to the survey. I construct a binary outcome variable, where 1 reflects

children who experienced diarrhea during the last two weeks, and 0 otherwise. Similarly, I excluded “don’t know” responses.

4.7.2 Explanatory Variables

Maternal Characteristics: TDHS has rich set of women’s autonomy and gender norm variables that allow me to assess the level of conformance to traditional gender roles and levels of autonomy for individual women. For instance, the TDHS asks respondents questions regarding their perceived gender roles such as whether they agree that family decisions should be made by men, it is better to educate a son rather than a daughter, and men are wiser than women. A woman’s acceptance of domestic violence is captured by questions such as whether she justify wife beating if she neglects the children, if she wastes money, or if she neglects the housework. I coded these variables as a binary outcome, where 1 is agreement with the statement, and 0 is the disagreement.

There are also questions capturing woman’s role in financial decision making such as whether she makes official business decisions, budget decisions or shopping. I coded these variables, 1 if she is the sole decision maker and 0 otherwise (including her husband or any other family member). And, there are questions to measure whether her husband exerts control over her social life, such as whether she agrees that her husband insists on knowing where she goes, and whether he limits her contact with female friends. I grouped those responses where husband exert control often, sometimes and always as 1, and husband never exert control responses as 0. I also assume that current employment is a form of autonomy and include her employment status in this section.

In addition to women’s autonomy and gender norm variables, I control for variables such as the mother’s age and her age at first birth, both of which are measured with

continuous variables. As mentioned before, parental education may play an important role in better child health outcomes. Therefore, I control for parental education by three dichotomous variables: no schooling, some education but less than high school education, high school and more education. Considering that a mother's smoking behavior during pregnancy is associated with adverse health outcomes for babies, whether a woman ever smoked[25] is included as a control variable while analyzing child birth weight.

The TDHS reports whether mother had received any antenatal care (professional or traditional), if so whether that care was due to an ordinary check-up or because of maternity complications. I control for whether antenatal care was due to any maternity complications as a proxy for the health status of women and children during the pregnancy while estimating the impact of gender roles on child birth weight.

Household Characteristics: Turkey has substantial social and cultural differences among five regions (east, north, south, central, and west) and between urban and rural areas. Therefore, I also control for region and type of residence to account for the geographic and cultural differences that are evident in Turkey.

The TDHS doesn't collect household income, so I used wealth indexes as a proxy to measure the financial wellbeing of the family. TDHS creates wealth index based on ownership of household items and durable goods such as car, refrigerator, television, air conditioner etc., as well as household characteristics such as source of drinking water, sanitation facilities and type of flooring material (TDHS, 2008). I grouped lowest and second quintile of wealth index as "poorer wealth index", middle quintile as "middle wealth index", and fourth and highest quintile as "richer wealth index".

[25] TDHS doesn't ask respondents whether they have smoked while they are pregnant, but ask respondents whether they ever smoked regularly

Child Characteristics: I control for child characteristics such as age in months in all outcome variables. Only for nutritional status outcome variables, I control for whether a child had a birth weight lower than 2.5 kg or not to control for his/her characteristics as well.

Table 4.1a provides age and birth weight for children under five years of age and the socio-economic characteristics of their parents. The mean age of mothers is 28.6, and the mean for age at first birth is 22.4. There are noticeable differences in the level of parental education for mothers and fathers. For instance, the percentage of mothers with no education is large at 14.8 percent, compared to 3.2 percent of fathers; and while 32.4 percent of fathers have more than high school education, this number falls to 19.9 percent for mothers. The mean employment for mothers is 31.0 percent. A significant minority of mothers holds beliefs related to male superiority; 17.7 percent agree that men are wiser, 18.9 percent believe important family decisions should be made by men, and 12.5 percent agree that it is better to educate sons rather than daughters. In addition, some of the women believe there are conditions under which it is acceptable for husbands to beat their wives. These include: when a woman neglects the children (15.1 percent), wastes money (16.2 percent), or neglects the housework (11.1 percent). Furthermore, 10.6 percent report that their husbands prevent them from seeing female friends, and 37.4 percent report that their husbands insist on knowing where they go, both of which suggest limited social mobility for these mothers. Descriptive statistics do indicate that mothers do have a moderate degree of autonomy in making household financial decisions. For instance, 22.8 percent of them make decisions related to the family business, 23.9 percent of them make household budget decisions, and 48.3 of them make shopping decisions.

Children are highly concentrated (46.7) in poorer families, only 21 percent of them are in the middle wealth category, and 32 percent of them are in the richer wealth category. They are more likely to live in urban neighborhoods (73.1 percent), and more likely to be Turkish (65.4). The mean age of children is 30 months, and 12 percent of them had a birth weight of less than 2.5 kilograms. Receiving professional medical care during pregnancy is very common in Turkey; 86.5 percent of the mothers had professional care during pregnancy, 3 percent had non-professional care, and only 10.5 percent of the mothers did not receive any type of care. Of those who had either professional or non-professional care, 22 percent report that the care was due to complications during their pregnancy, and the remaining 67.5 report that care was due to ordinary check-ups.

Table 4.1b presents descriptive information for child health outcome variables. The mean birth weight is 3.1 kg and 3.3 kg for female and male children respectively. About 18 percent of both female and male children have had diarrhea during the past two weeks. In terms of weight-for-age and height-for-weight scores, children in Turkey, on average, meet international standards. Both female children and male children have a positive mean of weight-for-age and height-for-age scores, and those scores are above the median of the U.S. population. However, in terms of the height-for-age scores, on average, neither female nor male children meet international standards for nutritional status, and mean height-for-age scores for both female and male children are below the median of the reference U.S. population (0.4 standard deviation). This indicates that the entire distribution has shifted downward. Table 4.1c presents the percent distribution of children's nutritional status by standard deviations. The percent distribution of height-for-age z-scores suggests that 68 percent of children fall below the median of the U.S. reference population. Of those children,

13 percent of them fall below the minus two standard deviations and are considered stunted (short for their ages), and 4.4 percent of children fall below the minus three standard deviation and are considered severely stunted. Distribution of weight-for-age scores represents a normal distribution, and about 57.5 percent of the children fall below the median of the U.S. reference population. When compared to height-for-age scores, the weight-for-age distribution suggests that these children have less of an acute nutritional problem, and only 3.4 percent of under five year old children fall below minus two standard deviation in terms of weight-for-age score and are therefore considered underweight. Height-for-weight scores indicate that only about 1 percent of children fall below the minus two standard deviations and are considered as wasted (too thin). No child falling below minus three standard deviations suggests that no child under five is severely wasted.

4.8 Principal Component Analysis

I find that the autonomy and gender role variables in my data are highly correlated with each other. To overcome this redundancy I used the Principal Component Analysis (PCA) method. PCA method uses an orthogonal transformation to reduce the high number of correlated variables to new lower number of uncorrelated variables (Johnson and Wichern 1998). The goal of this data reduction method is to summarize the original variables with fewer components while retaining the maximum amount of descriptive ability (Williams, 1992).

As a mathematical representation, let $E = (E_1, E_2, \dots, E_p)$ be autonomy variables. The covariance matrix of $\vec{E}$ represents the degree of the linear relationships among the inter-correlated autonomy variables, and it is helpful to see the degree of redundancy among the variables. By decomposing the correlation matrix (R), we can find the Eigenvectors $(\vec{u})$ and

Eigenvalues (λ) associated with principle components. Here Eigen vectors represent the direction of components that characterize the data in a vector form (rather than the usual axes) and Eigen values represent the variance of the associated components.

After running the PCA analysis in Stata I identified the Eigen values associated with each principle component (see table 4.2a). Since I have 12 autonomy variables entered into the PCA analysis, table 4.2a represent 12 principle components where all the components explain the 100 percent variation in the data. Due to the orthogonal nature of the linear transformation in the PCA, each succeeding component captures the remaining information not captured by the preceding component and uncorrelated with each other (Vyas and Kumaranayake, 2006). For instance, the first principal component has the largest possible variance and captures the largest variability among the autonomy variables (22 percent) followed by the second principle component (15 percent). The rule of thumb in selecting the number of principle components that enters into the analysis is to select Eigen values that are larger than 1. Therefore, I selected five components, and those five components explain 66 percent of the variation in the data.

The next step in PCA is to find the principal component loadings. Table 4.2b reports the component loadings on each autonomy variable and their correlational relationship with the principle components selected. I only report the ones with high correlation. I used a Varimax rotation method, an orthogonal rotation that helps to maximize a variable's loading on a single factor, to show a clear association between component loadings and autonomy variables (Mitra and Kundu 2012).

I named the principle components after the autonomy variables that they were loaded onto. For instance, component 1 is loaded onto three autonomy variables: whether the

respondent justifies wife beating if she neglects the children, if she wastes money, and if she neglects the housework. Therefore, I named this component "condones beating." Similarly, component 2 is loaded onto whether or not a respondent participates in official business decision making, or budget and shopping decisions, so I named the second component "has financial power." Likewise, component 3 is loaded onto three autonomy variables, whether or not a respondent agrees that family decisions should be made by men, it is better to educate a son, and men are wiser. These questions capture gender roles so I named the third component "favors men." Component four is loaded onto whether or not a husband limits the respondent's ability to see her female friends, and if he insists on knowing where she goes, so I named this component "husband exerts control over her." Component 5 is loaded only onto the whether or not a woman is employed or not variable, so I named this component "currently working."

4.9 Econometric Models

I used Ordinary Least Squares Regression to estimate child health outcome variables such as height-for-age, weight-for-age, and birth weight. I econometrically modeled these continuous outcome variables as follows,

$$y_i = \beta_0 + \beta_1 E_i + \beta_2 X_i + \propto_i$$

where y_i is one of the following outcomes: nutritional status (measured as z-scores for height-for-age, weight-for-age, and height-for-weight), or birth weight (measured in kilograms). X_i represents a vector of control variables such as parental education, mother's age, age at first birth, BMI, region and ethnicity, wealth index, child's age in months, and whether or not the child had a low birth weight. For the birth weight control variables I exclude child characteristics and control for additional variables such as whether or not their

mother ever smoked and if she received antenatal care. E_i is the vector of the five principal components that were selected from the principle component analysis to represent gender norms and autonomy variables.

Since whether or not a child had diarrhea during the two weeks prior to the survey is a binary measure, I use a Probit specification for this outcome variable:

$$Diarrhea_i^* = X_i'\beta + \varepsilon_i \qquad (3)$$

where $Diarrhea_i^*$ represents an unobserved, latent variable for the child i, and $x_{3i}^{'}$ is a vector of the principal components and the parental, household, and child characteristics (as explained above), β is a vector of parameter estimates that shows how each explanatory variable influences whether or not a child had diarrhea, and ε is an error term. I report the marginal effects[26] for this model in table 4.8.

4.10 Results

4.10.1 Determinants of Child Nutritional Status

Tables 4.3a and 4.4a present the determinants of child nutritional status which were estimated by the Ordinary Least Squared Method. As explained above, I measure child nutritional status by their height-for-age and weight-for-age anthropometric z-scores. In both tables I disaggregated my sample of children by gender to see if there is any gender bias in nutritional status outcomes. In the first model (first and third columns) I regress each nutritional status measure with maternal characteristics, wealth, and child characteristics without controlling for regional characteristics. In the second model (second and fourth columns) I include a control for regional differences. Considering that maternal

[26] Marginal effects derived from $f(x_i^{'}\beta)\beta_k$ where $f(x_i^{'}\beta)$ denotes the standard normal density function.

characteristics apply to siblings in the same household at any given time, I clustered standard errors at the mother level to obtain a cluster-robust covariance matrix estimator.

Determinants of Height-for-Age Z-Scores: Estimation results from Table 4.3a suggest that both boys and girls exhibit lower height-for-age z-scores if their mother condones domestic violence. For instance, an increase in the condoning domestic violence principle component reduces height-for-age z-scores by 0.050 and 0.066 standard deviation for boys and girls respectively. However, a mother's belief in male superiority affects girls and boys differently. Boys being raised by women who believe males are superior have a nutritional status advantage, and their height-for-age z-scores improve by 0.076 standard deviation. In contrast, girls raised by mothers who believe in male superiority suffer from nutritional disadvantage, and their height-for-age z-scores are 0.050 standard deviation lower than girls whose mothers do not adhere to these norms.

Girls raised in households where the mother exercises control over money have 0.063 standard deviation higher height-for-age z-scores, even when controlling for the wealth status of the family. However, the positive and significant nutritional impact conferred by the financial power of mothers fades away when controlling for region. Girls fare worse in terms of height-for-age scores when their mothers are constrained by their husbands in visiting female friends. Each unit increase in the limitation of the mother's social mobility reduces the girl's height-for-age z-score by a standard deviation of 0.067. However, there is no such impact on boys raised in households where the husband exerts control over the wife.

The impact of parental education has differential effects on the nutritional status of boys and girls. The height-for-age model for girls shows that girls fare better in terms of height-for-age nutritional status when they are raised in households with more highly

educated fathers. For instance, when compared to having fathers with no schooling, girls whose fathers have some education, but less than high school, have an improvement of 0.540 standard deviation in their height-for-age z-scores. This effect is even more evident for girls whose fathers have more than a high school educations, improving their height-for-age z-scores by 0.631 standard deviation. Conversely, boys fare better when they are raised in households with more highly educated mothers (0.296 standard deviation improvement in their height-for-age z-scores as their mother's education increases from no education to some education, less than high school, and more than high school education). Other maternal characteristics such as age, age at first marriage, and current employment status don't have statistically significant impacts on either girls or boys, with the exception of a mother's BMI. Increasing mothers' BMI by one unit increases the height-for-age z-scores of boys by 0.019 standard deviation, but it has no effect on girls.

Although an improvement in the wealth index has similar impacts on both boys and girls, boys in particular fare much better living in richer households compared to poorer households. For instance, living in households in the middle wealth index improves height-for-age z-scores by 0.217 and 0.292 standard deviation for girls and boys respectively. Living in richer households has an even larger impact for boys, improving their height-for-age z-score by as much as 0.548 standard deviation compared to boys living in poorer households.

There are no statistical differences in the nutritional status of either boys or girls based on living in urban or rural areas. However, living in either the West or Central regions improves both girls' (0.323 standard deviation) and boys' (0.317 standard deviation) height-for-age z-scores relative to children who live in the East region. Living in the South region

improves only boy's height-for-age z-scores by 0.512 standard deviation; however girls who live in the South region are not statistically different from girls living in the East region.

Children's characteristics have a similar impact in regards to girls' and boys' height-for-age z-scores. Having a low birth weight puts both girls (0.387 standard deviation) and boys (0.395 standard deviation) at a disadvantage in terms of height-for-age z-score relative to children with a normal birth weight (i.e a birth weight of more than 2.5 kg). In addition, for each year girls age, their height-for-age z-scores decrease by 0.017 standard deviation, for boys the size of this effect is substantially lower (0.009 standard deviation).

Determinants of Weight-for-Age Z-Scores: Estimation results for the weight-for-age model generally confirm the findings in the height-for-age model. In particular, the impact of control variables such as maternal characteristics, wealth, region, and child characteristics on weight-for-age z-scores is similar to those in the height-for-age model. Once again, the impact of belief in male superiority shows a gender bias in weight-for-age z-scores. Boys being raised by women who believe in male superiority have 0.035 standard deviation larger weight-for-age z-scores compared boys being raised by women who do not conform to such norms. In contrast, girls raised by women who believe in male superiority are disadvantaged, and their weight-for-age z-scores are lower by 0.027 standard deviation.

However, there are several differences worth noting. First, autonomy variables have less of an impact on weight-for-age z-scores. Although it suggests a weak significance (at the 10% level), both girls and boys have lower weight-for-age z-scores, 0.044 standard deviation and 0.055 standard deviation respectively, when raised in households where the husband exerts control over the wife. Second, different from the height-for-age model findings, higher BMIs in mothers have a positive and significant impact on both girls' (0.032 standard

deviation) and boys' weight-for-age z-scores (0.030 standard deviation), suggesting an intergenerational link between the nutritional status of the mother and the child. Even though the significance level slightly fades away after controlling the region variables, having a mother who possesses a higher level of education has a positive impact on girls' weight-for-age z-scores. By contrast, living in households within the middle wealth index quantile doesn't have any impact on weight-for-age z-scores relative to living in poorer households, for girls in particular. In addition, there is no statistical difference among different ethnicities in terms of weight-for-age z-scores.

Determinants of Height-for-Weight Z-Scores: Table 4.5a presents the height-for-weight model. Only boys exhibit higher height-for-weight z-scores if their mother condones domestic violence. For instance, an increase in the condoning domestic violence principle component increases height-for-weight z-scores by 0.052 standard deviation for boys, compared to women who do not conform to such norms. A mother's BMI has a positive impact on both girls and boys, improving their height-for-weight z-scores by 0.034 and 0.023 standard deviations respectively. In contrast, having a low birth weight reduces the height-for-weight z-scores for both girls (0.227 standard deviation) and boys (0.241 standard deviation).

4.10.2 Additional Considerations for the nutritional status models

In order to explore the impact of children's characteristics on nutritional status further, I ran additional models, replacing the mother's age, her age at first birth, and the child's age explanatory variables with child birth order and birth interval variables (see tables 4.3b, 4.4b and 4.5b). The motivation for this approach comes from the fact that age variables are correlated with the birth order of a child and birth interval variables (see table 4.6). When

I control for birth order, the main findings do not change from the previous nutritional status models, and birth order does not have a strong impact on either girls' or boys' nutritional status as measured by height-for-age, weight-for-age and height-for-weight z-scores.

However, controlling for the interval between births (the time between the preceding birth and the birth of the current child) reduces the significance of several autonomy components (i.e. condones beating and favors men), particularly in the model for height-for-age. This suggests a link between a woman's level of autonomy and the timing of her birth decisions. (Carlson [2013] shows that increased women's autonomy leads to longer birth intervals). Nevertheless, findings suggest that the height-for-age z-scores of girls are 0.548 standard deviation lower if they were born with a preceding birth interval of a less than 24 months when compared to those who were first-born. Girls who were born 24 to 48 months apart or 48 months or more apart are not at a nutritional disadvantage compared to first born girls. Similarly, boys have 0.208 standard deviation lower height-for-age z-score if they are born with a preceding birth interval of 24 to 48 months, compared to first born boys (Table 4.3b). Similarly, girls fare worse in terms of weight-for-age z-scores (0.396 standard deviation less) if they were born with a preceding birth interval of less than 24 months, compared to first born girls. For boys the size of this effect does not suggest strong significance (Table 4.4b). In addition, the impact of birth interval disappears in the height-for-weight model (Table 4.5b).

4.10.3 Determinants of Child Birth Weight

Table 7 presents the determinants of child birth weight which were estimated by the Ordinary Least Squared Method. Similar to the models for nutritional status, in the first and second columns I report the coefficients and standard errors for girls and in the third and

fourth columns I report the coefficients and standard errors for boys. In this model I control for two additional variables: whether or not a mother ever smoked regularly, and whether or not she had professional care when she was pregnant. To control for a mother's and her child's health status during her pregnancy I also disaggregated whether or not a mother had professional care into a binary measure: whether or not this care was due to a problem, and whether or not this care was an ordinary check-up.

A mother's BMI has a significant and positive impact on both girls' and boys' birth weights, suggesting an intergenerational link between mothers and children. A one unit increase in the mother's BMI increases birth weights by 0.166 kg and 0.151 kg for girls and boys respectively. An employed mother's daughters fare better in terms of birth weights compared to those whose mothers are unemployed. In addition, girls living in urban areas have 0.132 kg larger birth weights than girls living in rural areas. While there is no statistical difference between urban or rural areas for boy's birth weights, there are regional differences for them: boys living in the North region have 0.154 kg larger birth weights than boys living in the West region. In addition, boys whose mothers receive antenatal care (check-up) during pregnancy fare much better (0.282 kg more) in terms of their birth weight than those whose mothers had no antenatal care.

4.10.4 Probability of having diarrhea during the two weeks prior to the survey

Table 8 presents the determinants of the probability of having diarrhea during the two week prior to the survey, which were estimated using the Probit method. The model for the probability of having had diarrhea underscores the importance of a mother's education for her child rearing practices. For instance, both girls (9.0 percentage points) and boys (7.3 percentage points) are less likely to have had diarrhea if their mother has some education

(less than high school) compared to children whose mother has no schooling. Similarly, children whose mothers have more than a high school education are 7.6 percentage points (girls) and 11.2 percentage points (boys) less likely to have had diarrhea during the two weeks prior to the survey. A father's education doesn't have a significant impact on either girls' or boys' probability of having had diarrhea, probably due to the fact that they are not typically the main caregiver. An employed mother's daughters are 2.4 percentage points less likely to have had diarrhea. Similarly, as mothers get older by one year, their children's (both boys and girls) probability of having had diarrhea decreases by 0.5 percentage points. Also, as children themselves get older by one year their probability of having had diarrhea decreases by 0.5 percentage points.

Even though a family's level of wealth and living in urban areas are not significant indicators for either girls or boys, there are regional differences, especially for boys' probability of having had diarrhea. Compared to the East region, children living in the West (9.6 percentage points), South (8.9 percentage points), Central (13 percentage points), and North (8.8 percentage points) regions are less likely to have had diarrhea during the two weeks prior to the survey. Interestingly, there are no regional differentials for girls' probability of having had diarrhea**,** however there are ethnic differentials. For instance, being Turkish is negatively associated with the probability of having had diarrhea for girls (10 percentage points).

4.11 Discussion and Conclusions

In this study I use data from the 2008 Turkish Demographics and Health Survey in order to explore links between maternal socioeconomic conditions and child health status as measured by height-for-age, weight-for-age, weight-for-height, birth weight, and whether or

not a child had diarrhea in the two weeks prior to the survey. I find that 13 percent of children under five years of age were stunted, 12 percent of these children had low birth weights, and 36 percent of children had diarrhea in the two weeks prior to the survey. Stunting in children has been linked to problems with cognitive development, low educational attainments, and poor reproductive health in adulthood, all conditions that can disadvantage individuals, especially in the developing world (WHO 2012).

Factors affecting child nutritional status appear to be related to dimensions of a mother's autonomy, particularly height-for-age scores. A child's height-for-age score allows us to capture some of the long-term effects of chronic malnutrition; therefore my findings suggest that woman's autonomy has long-term consequences on her child's nutritional status. The implication of this finding is that a mother's short term loss of power has little effect on her child's growth; however, chronic lack of autonomy leads to chronically underdeveloped children. This may have important policy implications in the effort to reduce the number of stunted children in Turkey.

In addition, my findings show that a woman's adherence to traditional gender roles, such as condoning domestic violence and belief in male superiority, favors nutritional preference for boys, as evidenced in the positive impact of these beliefs on anthropometric scores, especially in height-for-age scores. However, girls raised by women who adhere to these roles are disadvantaged in terms of nutrition, resulting in lower height-for-age and weight-for-age scores. These finding indicate that mothers who lack of autonomy are more likely to exercise nutritional discrimination in favor of boys. This is problematic because the connection between a mother's autonomy and child health is self-perpetuating; mothers lacking autonomy tend to practice nutritional discrimination that harms the life chances of

girls, resulting in generations of young women at risk for adhering to social norms and perpetuating the very social structures that continue to disadvantage women.

My findings also indicate that a mother's educational level does not improve the nutritional status of her daughters; however, it reduces the probability of girls having had diarrhea. In contrast, I do find that women's education has a positive impact on nutritional status for boys. Even though after controlling for regional differences its significance fades away, my findings also indicate that girls raised in homes where the mother exercises at least some control over money exhibit higher height-for-age scores. These findings imply that the degree to which a mother is able to exercise autonomy in the household is more important for girls' nutritional status than her level of education. A woman's attitude toward traditional gender roles and her financial power both have a much greater impact on the health of girls. In addition, I find that girls fare better in terms of height-for-age and weight-for-age when they are raised in households with more highly educated fathers, a finding consistent with previous literature (Ergin *et al.* 2007).

A mother's employment status does not have an influence on her children's health status, probably due to fact that day care arrangements mainly provided by immediate family members ensures the dietary intake of her children. However, a mother's employment status improves her daughter's birth weight and reduces the probability of having had diarrhea. I also found that both girls and boys born with low birth weights are disadvantaged in terms of nutritional status and cannot catch up to the normal growth patterns. In addition, similar to Dancer and Rammonhan (2009), both height-for-age and weight-for-age scores steadily worsen as children in Turkey grow by each year, especially girls.

In general, there are regional differences in child health outcomes. Children living in the east region are the most disadvantaged in terms of nutritional status, and while I do not find ethnic differences in terms of nutritional outcomes, I find that Kurdish children are more likely than their Turkish counterparts to have diarrhea. Overall, my findings indicate that there is room to improve childhood health outcomes in Turkey, and therefore a child's life chances, with policies that support women's autonomy and investments in education, particularly for men.

Table 4.1a: Descriptive Statistics

	Mean (SD)
Mothers' Characteristics	
Age	28.66 (5.682)
Age at first birth	21.54 (4.178)
BMI	26.5 (5.11)
No education	14.8
Less than high school but some education	65.4
More than high school education	19.9
Whether ever smoked regularly (%)	28.6
Autonomy Variables (%)	
Agrees that men are wiser	17.7
Agrees that it is better to educate son than daughter	12.5
Agrees that important family decisions should be made by men	18.9
Justifies wife beating if she neglects the children	15.1
Justifies wife beating if she wastes money	16.2
Justifies wife beating if she neglects the housework	11.1
Whether makes decisions about official business	22.8
Whether makes decisions about household budget	23.9
Whether makes decisions about shopping	48.3
Whether currently employed	31.1
Whether her husband insist on knowing where she goes	37.4
Whether her husband prevent from seeing her female friends	10.6
Father's Characteristics (%)	
No education	3.2
Less than high school but some education	64.3
More than high school education	32.4
Wealth Index (%)	
Poorer	46.7
Middle	21.4
Richer	32.0
Region and Ethncity (%)	
Urban	73.1
East	23.7
West	35.2
South	13.6
Central	22.2
North	5.1
Turkish	65.4
Other	19.9
Antenatal Care (%)	
Whether had a Professional Antenatal Care	86.5
Whether had a Traditional Antenatal Care	3.0
Whether antenatal care was due to a problem	22.0
Whether antenatal care was an ordinary check-up	67.5
Child Characteristics	
Gender: Female (%)	48.5
Whether born with low birth weight (<2.5 kg) (%)	12.1
Age (in months)	30.19 (16.850)

Source: Authors' calculations from the 2008 Turkish Demographics and Health Surveys.
Notes: Standard errors in parentheses. Standard errors are only reported for continues measures. Weighted Estimates are reported.

Table 4.1b: Descriptive Stats for Outcome variables	Female Children	Male Children
Height-for-age Z score	-0.429	-0.421
	(1.319)	(1.268)
Weight-for-age Z score	0.0312	0.049
	(1.184)	(1.191)
Height-for-weight Z score	0.440	0.415
	(1.058)	(1.108)
Birth weight (kg)	3.109	3.290
	(0.691)	(0.681)
Whether had diarrhea (%)	18.6	18.1

Table 4.1c: Distribution of nutritional status	>0	Between -1 and 0	Between -2 and -1	Between -3 and -2	Below -3
Height-for-age Z score	32%	33%	22%	8.6%	4.4%
Weight-for-age Z score	46.5%	33%	16.5	3.4%	0.6%
Height-for-weight Z score	34%	58.9	6.2	0.9	0

Table 4.2a: Principal Components/Correlation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.69	0.88	0.22	0.22
Comp2	1.80	0.51	0.15	0.37
Comp3	1.29	0.10	0.11	0.48
Comp4	1.19	0.18	0.10	0.58
Comp5	1.01	0.28	0.08	0.66
Comp6	0.72	0.02	0.06	0.72
Comp7	0.70	0.05	0.06	0.78
Comp8	0.66	0.02	0.05	0.84
Comp9	0.64	0.12	0.05	0.89
Comp10	0.52	0.03	0.04	0.93
Comp11	0.49	0.19	0.04	0.97
Comp12	0.30	.	0.03	1.00

Table 4.2b: Varimax Rotated Components	Comp1	Comp2	Comp3	Comp4	Comp5
Agrees that men are wiser			0.53		
Agrees that it is better to educate son than daughter			0.60		
Agrees that important family decisions should be made by men			0.59		
Justifies wife beating if she neglects the children	0.60				
Justifies wife beating if she wastes money	0.52				
Justifies wife beating if she neglects the housework	0.59				
Whether makes decisions about official business		0.58			
Whether makes decisions about household budget		0.59			
Whether makes decisions about shopping		0.54			
Whether currently employed					0.99
Whether her husband insist on knowing where she goes				0.70	
Whether her husband prevent from seeing her female friends				0.70	

Notes: Components loadings >.3 is reported

Table 4.3a: Determinants of Height-for-Age Z-Scores

	Girls		Boys	
Condones Beating	-0.063**	-0.050**	-0.083**	-0.066**
	(0.026)	(0.027)	(0.024)	(0.025)
Has financial Power	0.063**	0.041	0.004	-0.009
	(0.031)	(0.032)	(0.028)	(0.028)
Favors men	-0.049**	-0.050**	0.068**	0.076**
	(0.014)	(0.015)	(0.014)	(0.017)
Husband exert control over her	-0.062*	-0.067**	-0.031	-0.032
	(0.034)	(0.034)	(0.032)	(0.033)
Currently Working	-0.008	-0.004	-0.040	-0.045
	(0.046)	(0.046)	(0.036)	(0.038)
Age	0.006	0.008	-0.007	-0.006
	(0.008)	(0.008)	(0.008)	(0.008)
Age at First Birth	0.007	0.007	-0.002	-0.002
	(0.011)	(0.011)	(0.010)	(0.010)
BMI	0.009	0.009	0.021**	0.019**
	(0.008)	(0.008)	(0.008)	(0.008)
Less than high school but some education	0.177	0.143	0.329**	0.295**
	(0.123)	(0.124)	(0.130)	(0.129)
More than high school education	0.218	0.190	0.350**	0.296*
	(0.169)	(0.170)	(0.168)	(0.165)
Less than high school but some education	0.498**	0.540**	-0.096	-0.140
	(0.221)	(0.220)	(0.259)	(0.254)
More than high school education	0.583**	0.631**	0.017	-0.007
	(0.233)	(0.232)	(0.269)	(0.264)
Urban		0.158		-0.013
		(0.096)		(0.089)
West		0.323**		0.317**
		(0.122)		(0.109)
South		0.135		0.512**
		(0.128)		(0.108)
Central		0.235**		0.299**
		(0.117)		(0.105)
North		0.232*		0.276*
		(0.134)		(0.141)
Middle	0.284**	0.217**	0.301**	0.292**
	(0.106)	(0.107)	(0.091)	(0.096)
Richer	0.389**	0.281**	0.560**	0.548**
	(0.106)	(0.113)	(0.095)	(0.101)
Turkish	0.317**	0.193*	0.034	-0.111
	(0.098)	(0.112)	(0.093)	(0.097)
Whether born with low birth weight (<2.5kg)	-0.382**	-0.387**	-0.398**	-0.395**
	(0.105)	(0.104)	(0.113)	(0.114)
Age	-0.017**	-0.017**	-0.008**	-0.009**
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-1.508**	-1.719**	-0.973**	-0.986**
	(0.370)	(0.384)	(0.376)	(0.375)
Observations	1179	1179	1255	1255
R-squared	0.182	0.190	0.144	0.159

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.4a: Determinants of Weight-for-Age Z-Scores

	Girls		Boys	
Condones Beating	-0.025	-0.014	-0.014	-0.001
	(0.022)	(0.022)	(0.023)	(0.024)
Has financial Power	0.039	0.019	0.011	0.004
	(0.032)	(0.032)	(0.027)	(0.028)
Favors men	-0.026**	-0.027**	0.031**	0.035**
	(0.011)	(0.011)	(0.014)	(0.017)
Husband exert control over her	-0.042	-0.044*	-0.056*	-0.055*
	(0.026)	(0.026)	(0.028)	(0.028)
Currently Working	0.016	0.014	0.015	0.015
	(0.040)	(0.041)	(0.036)	(0.036)
Age	-0.005	-0.003	-0.011	-0.010
	(0.007)	(0.007)	(0.007)	(0.007)
Age at First Birth	0.013	0.012	-0.001	-0.000
	(0.010)	(0.010)	(0.009)	(0.009)
BMI	0.032**	0.033**	0.033**	0.030**
	(0.007)	(0.007)	(0.007)	(0.007)
Less than high school but some education	0.157*	0.126	0.280**	0.251**
	(0.094)	(0.096)	(0.113)	(0.113)
More than high school education	0.290**	0.263*	0.378**	0.335**
	(0.138)	(0.137)	(0.157)	(0.155)
Less than high school but some education	0.334**	0.367**	-0.350*	-0.387*
	(0.156)	(0.158)	(0.210)	(0.208)
More than high school education	0.362**	0.397**	-0.204	-0.223
	(0.172)	(0.173)	(0.220)	(0.218)
Urban		0.130		-0.001
		(0.081)		(0.080)
West		0.279**		0.248**
		(0.106)		(0.106)
South		0.137		0.389**
		(0.116)		(0.104)
Central		0.194*		0.349**
		(0.105)		(0.105)
North		0.335**		0.184
		(0.131)		(0.135)
Middle	0.198**	0.140	0.179**	0.173*
	(0.097)	(0.097)	(0.089)	(0.091)
Richer	0.305**	0.214**	0.267**	0.242**
	(0.101)	(0.105)	(0.099)	(0.102)
Turkish	0.231**	0.110	0.135	-0.002
	(0.088)	(0.096)	(0.092)	(0.099)
Whether born with low birth weight (<2.5kg)	-0.436**	-0.440**	-0.432**	-0.428**
	(0.093)	(0.092)	(0.112)	(0.113)
Age	-0.012**	-0.012**	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-1.337**	-1.503**	-0.516	-0.532
	(0.307)	(0.311)	(0.319)	(0.324)
Observations	1179	1179	1255	1255
R-squared	0.160	0.169	0.108	0.121

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.5a: Determinants of Height-for-Weight Z-Scores

	Girls		Boys	
Condones Beating	0.018	0.021	0.049**	0.052**
	(0.022)	(0.022)	(0.020)	(0.021)
Has financial Power	0.001	-0.007	0.014	0.015
	(0.031)	(0.032)	(0.025)	(0.025)
Favors men	0.009	0.009	-0.014	-0.015
	(0.016)	(0.016)	(0.010)	(0.011)
Husband exert control over her	0.004	0.006	-0.040	-0.039
	(0.026)	(0.026)	(0.026)	(0.026)
Currently Working	0.026	0.019	0.048	0.054
	(0.038)	(0.039)	(0.035)	(0.036)
Age	-0.011	-0.010	-0.010	-0.009
	(0.007)	(0.007)	(0.007)	(0.007)
Age at First Birth	0.011	0.010	0.004	0.005
	(0.010)	(0.010)	(0.009)	(0.009)
BMI	0.034**	0.034**	0.024**	0.023**
	(0.006)	(0.007)	(0.006)	(0.006)
Less than high school but some education	0.071	0.056	0.102	0.093
	(0.087)	(0.087)	(0.109)	(0.109)
More than high school education	0.205	0.192	0.206	0.196
	(0.138)	(0.137)	(0.153)	(0.152)
Less than high school but some education	0.087	0.093	-0.362*	-0.372*
	(0.165)	(0.167)	(0.198)	(0.200)
More than high school education	0.032	0.036	-0.260	-0.264
	(0.179)	(0.180)	(0.209)	(0.210)
Urban		0.028		0.010
		(0.077)		(0.076)
West		0.099		0.032
		(0.105)		(0.099)
South		0.082		0.078
		(0.109)		(0.096)
Central		0.064		0.176*
		(0.100)		(0.102)
North		0.252*		-0.020
		(0.134)		(0.125)
Middle	0.005	-0.012	-0.005	-0.001
	(0.089)	(0.090)	(0.081)	(0.084)
Richer	0.093	0.070	-0.075	-0.092
	(0.095)	(0.100)	(0.095)	(0.097)
Turkish	0.087	0.029	0.160*	0.113
	(0.081)	(0.087)	(0.086)	(0.097)
Whether born with low birth weight (<2.5kg)	-0.227**	-0.227**	-0.242**	-0.241**
	(0.090)	(0.090)	(0.098)	(0.098)
Age	0.000	0.000	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.601**	-0.637**	0.021	0.009
	(0.295)	(0.300)	(0.300)	(0.306)
Observations	1179	1179	1255	1255
R-squared	0.040	0.044	0.040	0.043

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.6: Additional Considerations

	Birth Order			Birth Interval		
	(1)	(2)	(3)	(1)	(2)	(3)
Age	0.193**			3.137**		
	(0.007)			(0.118)		
Age at First Birth		-0.140**			-1.348**	
		(0.009)			(0.131)	
Age of child			0.002			0.055
			(0.002)			(0.035)
Constant	-2.866**	5.667**	2.606**	-57.221**	62.607**	32.463**
	(0.193)	(0.220)	(0.064)	(3.138)	(2.952)	(1.171)
Observations	3857	3857	3779	3471	3471	3410
R-squared	0.318	0.085	0.000	0.271	0.025	0.001

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.3b: Determinants of Height-for-Age Z-Scores

	Girls		Boys	
Condones Beating	-0.046**	-0.053*	-0.060**	-0.062**
	(0.027)	(0.030)	(0.025)	(0.027)
Has financial Power	0.033	0.026	-0.020	-0.028
	(0.032)	(0.033)	(0.028)	(0.029)
Favors men	-0.055**	-0.041*	0.080**	0.083**
	(0.013)	(0.022)	(0.014)	(0.016)
Husband exert control over her	-0.075**	-0.072**	-0.032	-0.020
	(0.034)	(0.036)	(0.033)	(0.037)
Currently Working	-0.018	-0.023	-0.060	-0.066
	(0.047)	(0.049)	(0.038)	(0.041)
BMI	0.014*	0.012	0.017**	0.015*
	(0.080)	(0.086)	(0.075)	(0.080)
Less than high school but some education	0.115	0.175	0.289**	0.331**
	(0.130)	(0.135)	(0.134)	(0.136)
More than high school education	0.194	0.293*	0.290*	0.348**
	(0.174)	(0.177)	(0.169)	(0.171)
Less than high school but some education	0.570**	0.659**	-0.204	-0.277
	(0.232)	(0.234)	(0.266)	(0.262)
More than high school education	0.669**	0.734**	-0.059	-0.105
	(0.244)	(0.247)	(0.275)	(0.271)
Urban	0.125	0.123	-0.029	-0.062
	(0.100)	(0.107)	(0.090)	(0.096)
West	0.334**	0.279**	0.305**	0.318**
	(0.125)	(0.126)	(0.111)	(0.117)
South	0.089	0.046	0.502**	0.507**
	(0.127)	(0.128)	(0.107)	(0.115)
Central	0.188	0.154	0.302**	0.318**
	(0.119)	(0.124)	(0.105)	(0.112)
North	0.192	0.136	0.277**	0.314**
	(0.136)	(0.144)	(0.139)	(0.159)
Middle	0.236**	0.216*	0.300**	0.313**
	(0.110)	(0.114)	(0.096)	(0.107)
Richer	0.286**	0.216*	0.541**	0.507**
	(0.113)	(0.117)	(0.102)	(0.110)
Turkish	0.176	0.165	-0.140	-0.167
	(0.115)	(0.120)	(0.099)	(0.106)
Whether born with low birth weight (<2.5kg)	-0.382**	-0.420**	-0.421**	-0.567**
	(0.103)	(0.109)	(0.114)	(0.129)
Birth interval: Less than 24 months		-0.548**		-0.110
		(0.139)		(0.124)
Birth Interval: 24 to 48 months		-0.121		-0.208**
		(0.106)		(0.102)
Birth Interval: 48 months and more		-0.015		-0.009
		(0.098)		(0.090)
Birth order	-0.041*		-0.030	
	(0.024)		(0.024)	
Constant	-1.828**	-1.846**	-1.232**	-1.101**
	(0.331)	(0.325)	(0.374)	(0.359)
Observations	1179	1075	1255	1128
R-squared	0.150	0.171	0.147	0.160

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.4b: Determinants of Weight-for-Age Z-Scores

	Girls		Boys	
Condones Beating	-0.011	-0.019	0.003	0.005
	(0.023)	(0.024)	(0.024)	(0.026)
Has financial Power	0.008	0.007	-0.008	-0.017
	(0.032)	(0.032)	(0.028)	(0.028)
Favors men	-0.030**	-0.022*	0.039**	0.036**
	(0.009)	(0.012)	(0.014)	(0.015)
Husband exert control over her	-0.050*	-0.049*	-0.057**	-0.058*
	(0.026)	(0.028)	(0.029)	(0.032)
Currently Working	-0.000	0.009	0.004	0.005
	(0.042)	(0.044)	(0.036)	(0.038)
BMI	0.033**	0.033**	0.027**	0.025**
	(0.072)	(0.078)	(0.068)	(0.073)
Less than high school but some education	0.133	0.160	0.263**	0.322**
	(0.098)	(0.103)	(0.115)	(0.119)
More than high school education	0.307**	0.322**	0.346**	0.428**
	(0.140)	(0.145)	(0.157)	(0.162)
Less than high school but some education	0.433**	0.477**	-0.421**	-0.464**
	(0.163)	(0.160)	(0.211)	(0.232)
More than high school education	0.477**	0.511**	-0.247	-0.285
	(0.176)	(0.175)	(0.222)	(0.243)
Urban	0.110	0.094	-0.009	-0.033
	(0.084)	(0.088)	(0.080)	(0.086)
West	0.297**	0.242**	0.241**	0.249**
	(0.107)	(0.109)	(0.107)	(0.114)
South	0.105	0.088	0.389**	0.372**
	(0.117)	(0.121)	(0.104)	(0.109)
Central	0.160	0.148	0.353**	0.367**
	(0.107)	(0.111)	(0.106)	(0.111)
North	0.316**	0.307**	0.177	0.153
	(0.131)	(0.141)	(0.133)	(0.144)
Middle	0.156	0.181*	0.182**	0.182*
	(0.098)	(0.101)	(0.092)	(0.100)
Richer	0.202*	0.189*	0.232**	0.177
	(0.105)	(0.107)	(0.103)	(0.109)
Turkish	0.100	0.092	-0.015	-0.053
	(0.099)	(0.102)	(0.101)	(0.109)
Whether born with low birth weight (<2.5kg)	-0.437**	-0.477**	-0.442**	-0.581**
	(0.089)	(0.089)	(0.113)	(0.117)
Birth interval: Less than 24 months		-0.369**		-0.178*
		(0.115)		(0.102)
Birth Interval: 24 to 48 months		-0.108		-0.087
		(0.095)		(0.091)
Birth Interval: 48 months and more		-0.138		-0.038
		(0.094)		(0.090)
Birth order	-0.026		-0.016	
	(0.021)		(0.021)	
Constant	-1.677**	-1.643**	-0.806**	-0.696**
	(0.269)	(0.264)	(0.290)	(0.309)
Observations	1179	1075	1255	1128
R-squared	0.140	0.152	0.113	0.123

Robust standard errors in parentheses

Table 4.5b: Determinants of Height-for-Weight Z-Scores

	Girls		Boys	
Condones Beating	0.021	0.014	0.051**	0.053**
	(0.022)	(0.023)	(0.021)	(0.021)
Has financial Power	-0.011	0.001	0.013	0.007
	(0.032)	(0.031)	(0.025)	(0.025)
Favors men	0.009	0.014	-0.014	-0.019*
	(0.016)	(0.028)	(0.010)	(0.010)
Husband exert control over her	0.006	0.003	-0.041	-0.051*
	(0.026)	(0.028)	(0.026)	(0.029)
Currently Working	0.014	0.039	0.056	0.052
	(0.039)	(0.040)	(0.036)	(0.038)
BMI	0.031**	0.032**	0.021**	0.021**
	(0.063)	(0.068)	(0.061)	(0.064)
Less than high school but some education	0.080	0.086	0.111	0.171
	(0.087)	(0.091)	(0.111)	(0.108)
More than high school education	0.233*	0.195	0.214	0.286*
	(0.137)	(0.145)	(0.152)	(0.159)
Less than high school but some education	0.137	0.133	-0.355*	-0.356*
	(0.165)	(0.163)	(0.196)	(0.214)
More than high school education	0.090	0.092	-0.245	-0.262
	(0.178)	(0.179)	(0.207)	(0.227)
Urban	0.030		0.014	
	(0.078)		(0.076)	
West	0.109		0.034	
	(0.105)		(0.099)	
South	0.083		0.085	
	(0.109)		(0.096)	
Central	0.060		0.177*	
	(0.100)		(0.102)	
North	0.260**		-0.031	
	(0.133)		(0.124)	
Middle	-0.009	0.045	0.001	-0.020
	(0.090)	(0.095)	(0.084)	(0.088)
Richer	0.054	0.104	-0.102	-0.118
	(0.100)	(0.101)	(0.097)	(0.102)
Turkish	0.030	0.088	0.123	0.129
	(0.088)	(0.085)	(0.099)	(0.093)
Whether born with low birth weight (<2.5kg)	-0.226**	-0.244**	-0.234**	-0.290**
	(0.089)	(0.092)	(0.099)	(0.097)
Birth interval: Less than 24 months	-0.002		0.002	
	(0.019)		(0.020)	
Birth Interval: 24 to 48 months		-0.051		-0.172*
		(0.102)		(0.102)
Birth Interval: 48 months and more		-0.044		0.028
		(0.092)		(0.084)
Birth order		-0.157*		-0.052
		(0.093)		(0.083)
Constant	-0.691**	-0.613**	-0.058	-0.008
	(0.241)	(0.238)	(0.255)	(0.267)
Observations	1179	1075	1255	1128
R-squared	0.042	0.039	0.041	0.042

Robust standard errors in parentheses

Table 4.7: Determinants of Birth Weight

	Girls		Boys	
Condones Beating	-0.015	-0.010	-0.038**	-0.026
	(0.017)	(0.018)	(0.016)	(0.016)
Has financial Power	0.020	0.015	-0.010	-0.016
	(0.018)	(0.019)	(0.018)	(0.018)
Favors men	-0.003	-0.000	-0.020*	-0.016
	(0.018)	(0.018)	(0.010)	(0.010)
Husband exert control over her	0.009	0.007	-0.016	-0.014
	(0.023)	(0.023)	(0.023)	(0.023)
Currently Working	0.043**	0.059**	0.010	0.003
	(0.023)	(0.024)	(0.023)	(0.024)
Age	0.000	0.002	0.006	0.007
	(0.005)	(0.005)	(0.005)	(0.005)
Age at first birth	-0.012*	-0.014**	-0.018**	-0.021**
	(0.007)	(0.007)	(0.007)	(0.007)
BMI	0.017**	0.016**	0.016**	0.015**
	(0.045)	(0.044)	(0.045)	(0.044)
Whether Ever Smoked Regularly	-0.001	-0.010	0.084*	0.082*
	(0.046)	(0.046)	(0.048)	(0.049)
Less than high school but some education	0.100	0.101	0.128	0.079
	(0.088)	(0.094)	(0.098)	(0.106)
More than high school education	0.162*	0.174*	0.139	0.049
	(0.093)	(0.103)	(0.107)	(0.115)
Less than high school but some education	-0.006	0.007	0.032	-0.048
	(0.206)	(0.209)	(0.172)	(0.176)
More than high school education	0.064	0.088	0.171	0.069
	(0.209)	(0.213)	(0.174)	(0.179)
Middle		0.016		0.113*
		(0.062)		(0.058)
Richer		-0.102		0.099
		(0.070)		(0.060)
Urban		0.132**		-0.015
		(0.063)		(0.056)
West		-0.028		0.102
		(0.070)		(0.065)
South		-0.007		0.069
		(0.073)		(0.082)
Central		-0.070		0.034
		(0.067)		(0.064)
North		-0.018		0.154**
		(0.081)		(0.077)
Turkish		0.020		-0.059
		(0.069)		(0.071)
Whether antenatal care was due to a problem		0.059		0.154
		(0.102)		(0.126)
Whether antenatal care was an ordinary check-up		0.145		0.282**
		(0.095)		(0.118)
Constant	2.802**	2.631**	2.821**	2.748**
	(0.254)	(0.265)	(0.246)	(0.262)
Observations	1258	1258	1330	1330
R-squared	0.029	0.043	0.043	0.063

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Table 4.8: Determinants of probability of having diarrhea during the past two weeks

	Girls		Boys	
Condones Beating	-0.003	-0.003	0.007	0.003
	(0.007)	(0.007)	(0.007)	(0.007)
Has financial Power	0.005	0.006	0.011	0.013
	(0.010)	(0.010)	(0.009)	(0.009)
Favors men	-0.007	-0.007	-0.005	-0.004
	(0.006)	(0.006)	(0.007)	(0.007)
Husband exert control over her	-0.002	-0.001	-0.015	-0.015
	(0.009)	(0.009)	(0.010)	(0.010)
Currently Working	-0.027**	-0.024**	-0.013	-0.009
	(0.012)	(0.012)	(0.012)	(0.012)
Age	-0.005**	-0.005**	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Age at First Birth	-0.001	-0.001	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
BMI	-0.002	-0.002	-0.002	-0.002
	(0.022)	(0.022)	(0.022)	(0.022)
Less than high school but some education	-0.095**	-0.090**	-0.083**	-0.073**
	(0.032)	(0.033)	(0.035)	(0.034)
More than high school education	-0.078**	-0.076**	-0.122**	-0.112**
	(0.036)	(0.037)	(0.034)	(0.034)
Less than high school but some education	-0.076	-0.070	0.050	0.060
	(0.054)	(0.053)	(0.056)	(0.054)
More than high school education	-0.094*	-0.091*	0.032	0.036
	(0.048)	(0.048)	(0.066)	(0.065)
Urban		0.026		0.018
		(0.025)		(0.025)
West		-0.017		-0.096**
		(0.034)		(0.026)
South		-0.051		-0.089**
		(0.032)		(0.026)
Central		0.008		-0.130**
		(0.036)		(0.024)
North		0.012		-0.088**
		(0.044)		(0.033)
Middle	-0.003	-0.012	-0.021	-0.014
	(0.030)	(0.031)	(0.028)	(0.029)
Richer	0.020	0.010	0.010	0.025
	(0.035)	(0.037)	(0.032)	(0.035)
Turkish	-0.097**	-0.100**	-0.076**	-0.017
	(0.028)	(0.032)	(0.029)	(0.030)
Whether born with low birth weight (<2.5kg)	-0.031	-0.032	-0.032	-0.040
	(0.028)	(0.027)	(0.031)	(0.030)
Age	-0.005**	-0.005**	-0.003**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Observations				

Notes: Robust standard errors in parentheses ** p<0.05, * p<0.1

Chapter 5: Conclusion and Discussions

With a world population topping out at over seven billion in the early years of the 21st century, concern over health is becoming an ever more pressing matter for individuals, health care systems, and governments. Along with this growth is the rapid development of medical technologies that will enable some of that population to live longer and enjoy better health than the rest. That the majority of that seven billion will not benefit from improvements in health care is a complicated issue researchers around the globe are struggling to address. Disparities in health are complicated and multivalent, driven by individual factors, prevailing social conditions, government priorities, and various health care structures experienced by individuals. This dissertation looks at some of these problems from the perspective of race, ethnicity, and gender for people in the United States and Turkey to provide a detailed analysis of the current barriers to health and health care in these countries.

5.1 Chapter 2

5.1.1 Gaps in the literature

In chapter 2 I sought to explain the disparities in access to health care that exist between Hispanic and non-Hispanic whites in the United States. This area of research had not been adequately updated in a number of ways. First, previous research failed to provide a satisfactory explanation for access to care disparities, and no study to date has controlled for all the relevant sources of these disparities. Second, the methodological approaches taken by previous studies did not allow for consideration of the non-linearity of the access to care variables. Additionally, previous research did not separate populations out on the basis of gender, and so has been unable to account for the differences between men and women in access to care. Through updated methods, using the most current available data, and a more

complex set of variables, I provided an update to access to care disparities between non-Hispanic Whites and Hispanics.

5.1.2 Summary of major findings

Language is an important contributor to disparities in access to care, as English proficiency accounts for approximately one fourth of the differences between Hispanics and non-Hispanic whites. Language barriers create profound problems for non-English proficient individuals attempting to navigate a highly complex medical care system, therefore more efforts need to be made to bridge the gap between the patient and their provider, clinic, hospital, and the overall system. My findings confirm that insurance status remains important in individual's ability to access care; however, increasing insurance coverage rates is only one way to diminish barriers to access to care. This study shows that there are other non-financial barriers that must be understood and incorporated into policy recommendations in order for these disparities to be fully addressed and overcome.

Citizenship status and the racial and ethnic composition of neighborhoods are also important as these individual characteristics are associated with health care-seeking behaviors. In addition, disparities in access to care between women and men remain unexplained, even when differences in their attitudes and beliefs regarding healthcare are controlled for, especially for Hispanic men and women. Promoting access to care therefore goes beyond institutional improvements in the health care field. More needs to be done to determine what individual characteristics are contributing to these disparities as well as how to address and overcome them.

5.1.3 Contributions

My findings underscore the importance of taking a complex approach to the factors that affect access to care disparities. Although the Affordable Care Act mandate for insurance coverage is seen as a way to eliminate the differences in access to care, this in and of itself will not solve the problem since it is complex and cannot be fixed with a straightforward solution. We need to take into consideration the various aspects of an individual's life that are influencing their access to care beyond insurance, including their environment and social context, legal status, and language use. These considerations also extend to gender differences, which have been overlooked in the past by researchers who conflated the two categories. Separating them, as in the current study, allows us to begin to explore the reasons why Hispanic men experience lower access to care, but further study is needed to understand what is driving these differences. This research provides important insight into the complex nature of disparities and what direction research needs to take to solve these problems.

5.1.4 Policy implications

The results of this chapter have several important policy implications. First, the results suggest that the disparities in access to care are dynamic and changing; therefore, continuing efforts are needed to measure, understand, and address how an individual's racial and ethnic context is affecting their ability to seek out the health care available to them. Second, although providing health insurance coverage for Hispanics will help to reduce disparities in access to care, this in and of itself will not completely eliminate the problem. In order to increase the effectiveness of insurance mandate with the Affordable Care Act, policies need to address barriers that undocumented immigrants or families with mixed immigration status face in obtaining insurance coverage through the Marketplace and Medicaid eligibility expansion. This is important since the number of undocumented

immigrants in the United States is now at around 12 million, a significant number of individuals whose health matters both economically to the nation and to themselves and their families. Policies needs to go beyond economic factors that contribute to the access to care disparities and focus on social and cultural factors as well such as implementing policies that are gender sensitive, increasing linguistic and cultural capacity of the health care system, and training a more diverse workforce in health care.

5.1.5 Directions for future research

More research is needed to understand the role the racial and ethnic composition of a neighborhood plays in regard to access to care. There is also a lack of literature on the racial and ethnic disparities in sustained access to care and the impact access to care interruptions has on health outcomes. Examining whether or not access to care is sustained and the effect this has on health outcomes will bring another dimension to the ongoing discussion on improving access to care for minorities. These new considerations have the potential to contribute to the agenda of reducing the societal cost of health care by improving the health and increasing the longevity of minorities.

5.2 Chapter 3

5.2.1 Gaps in the literature

Improving minority representation among physicians to address issues of health disparities among minority groups has been a potential solution proposed by policy makers and researchers alike. However intuitively correct this solution may seem little is known about how achieving such representation (and therefore increasing the chances of concordance) would affect minorities, especially Hispanics. More work is needed to inform resource allocation based on evidence from empirical research. And although the existing

literature has enhanced our understanding of concordance and its impact on satisfaction for Hispanics, drawing conclusions and making recommendations based on these findings is difficult due to the mixed nature of the results. In chapter 3 I explored the specific effects concordance has on Hispanic's satisfaction with their health care with the goal of contributing to a larger picture of how we need to address disparities in access to health care.

5.2.2 Summary of major findings

I find that acculturation is important when considering patient satisfaction, as individuals who have spent a greater proportion of their lives in the U.S. report higher levels of satisfaction with their medical care than their less acculturated counterparts. Although both Hispanic women and men prefer racially and ethnically concordant providers, I find no statistical significance for Hispanic women and their satisfaction, based on concordance, in terms of overall satisfaction with their care. I do find that Hispanic men are actually less likely to be satisfied with some aspects of their medical care when they are racially and ethnically concordant with their provider. Communication is the most strongly influential aspect of satisfaction for Hispanic men, and that satisfaction is not necessarily facilitated by racial and ethnic concordance**.**

5.2.3 Contributions

My findings indicate that there are nuances in care preferences that go beyond the idea that matching will improve the experiences of minorities and eventually contribute to reducing health disparities among minority populations. I find that increasing the racial and ethnic diversity of the workforce may not be enough to provide adequate and satisfactory medical care to minority individuals, especially Hispanic men. Working to diversify health care workforce will undoubtedly have benefits, but doing so is effectively more complicated

than previously thought. My results show that patient/provider encounters are not completely facilitated by concordance alone. A patient's level of acculturation along with provider qualities such as the ability to communicate, show respect, and spend the time necessary to provide good care each play an important role in how an individual perceives their health care experiences.

5.2.4 Policy implications

Overcoming our assumptions about shared identity is a crucial step in providing culturally competent care for all patients, and Hispanics are no exception. There is a need for additional considerations in medical training to help physicians make a "match" with their patients regardless of any type of observable concordance. Policies need to be developed to help physicians provide patient-centered care that takes into account individuals' preferences, needs, and values and seeks input from the patients in regards to their care.

5.2.5 Directions for future research

Future research needs to go beyond considering the physician to include patient satisfaction with other medical staff, including nurses and administrators. More research is also needed to explore whether or not a greater level of concordance will affect health care expenditures and if so, in which direction and by how much. This information will help us to determine whether or not having a diverse health workforce will have an effect on health expenditures and help policy makers take necessary steps to manage costs while continuing efforts to increase the minority health workforce.

5.3 Chapter 4

5.3.1 Gaps in the Literature

In their traditional role as primary caregivers, women in developing countries are in a position to influence their children's health directly through the quality of care they are able to provide. Women's ability to provide care for children is mediated or conditioned by her social context, material conditions, and the amount of agency she is able to practice within a particular culture. These are areas of particular interest and ones that are understudied. While there are studies that explore the determinants of children's nutrition status in Turkey, the impact of mother's autonomy has been overlooked in the empirical analyses. Although Turkey has been able to reduce rates of stunting in children over the past few decades, there remain a significant proportion of children (1 in 10) who never reach their full growth potential. Since stunted growth in children is linked to a number of negative health outcomes, increasing the number of children without supporting their health and growth may have unexpected and unwanted consequences (including economic) for the country as a whole. In Chapter 4 I examined the connections between a mother's level of autonomy and the health of her children in Turkey.

5.3.2 Summary of major findings

I find that factors affecting child nutritional status appear to be related to dimensions of a mother's autonomy, particularly children's height-for-age scores. A mother's autonomy is positively associated with her children's nutritional status and that level of autonomy has long-term consequences for her child's nutritional status (i.e being stunted is difficult to reverse). My findings indicate that a mother lacking personal autonomy (those who condone domestic violence and believe in male superiority) is more likely to exercise a nutritional discrimination in favor of her male children. Furthermore, I find that the degree to which a mother is able to exercise autonomy in the household is more important for her daughter's

nutritional status than her level of education. Level of education for mothers in Turkey only improves the nutritional status of male children and reduces the likelihood of a child having diarrhea. Lastly, a father's education emerged as important for his children's health, and the daughters of more highly educated fathers in particular fare better in terms of nutritional status and growth outcomes.

In general, there are regional differences in child health outcomes. Children living in the east region are the most disadvantaged in terms of nutritional status, and while I do not find ethnic differences in terms of nutritional outcomes, I find that Kurdish children are more likely than their Turkish counterparts to have diarrhea.

5.3.3 Contributions

My findings echo those of other studies postulating the importance of social context on child health outcomes. The Turkish government's efforts to promote childbearing and increase the population have overlooked some important issues for women and their children. Increasing the number of children while ignoring the material and social conditions of those children and their families may result in long-term problems for the population.

My findings show that a mother's autonomy greatly impacts her children's health outcomes and may have long term consequences for their growth and subsequent adult health. Autonomy and growth are connected since both occur over time. A mother unable to exercise autonomy, one with little control over decision making, is more likely to have children who suffer from long term, poor nutritional status; therefore, a mother's condition contributes to her child's health and growth in ways she may be unable to control.

The effects of both low autonomy for mothers and poor child growth attainments are cumulative. Short term loss of power has little effect on child growth; however, chronic lack

of autonomy leads to chronically underdeveloped children. Additionally, the connection between a mother's autonomy and child health is self-perpetuating, since mothers lacking autonomy tend to practice nutritional discrimination that harms the life chances of girls, resulting in generations of young women at risk for adhering to social norms and perpetuating the very social structures that continue to disadvantage women.

5.3.4 Policy implications

Gender norms in Turkey create expectations for women's behavior that most often lead to motherhood. In spite of the fact that the country has been pushing for population growth (in part through reinforcing the role of mothers), increasing the number of children without improving the conditions of their mothers has significant consequences. Although women in Turkey are beginning to benefit from social advances, they are still expected to assume motherhood as their primary role, relegating all other potential life outcomes to the sidelines at best. This condition results in behavioral limitations that reduce a woman's autonomy, and the consequences, as I have shown here, reach down to the children, therefore, social policies need to take into account efforts to improvement the status of women, not only for them, but for the health of future generations as well.

Although I hypothesize that more highly educated parents will be more productive in translating health inputs into better child health outcomes, my findings indicate that increased levels of education do not necessarily result in adults capable of producing improved child health outcomes, especially for mothers. Continuing efforts to increase educational attainment are necessary in Turkey, but emphasizing quality of education over quantity for adults may be more effective in improving conditions for their children.

There are ethnic differences affecting the likelihood of a child having diarrhea, and Kurdish children are more likely to suffer from this condition. What is not clear is what is contributing to this increase. We do not know if it is caused environmental conditions that could be improved for this group, including improving the quality of drinking water and food supplies. Implementing policies aimed at enhancing the conditions for children living in the east and Kurdish children is necessary to create greater life chances for them.

5.3.5 Directions for future research

Turkey provides unique opportunities for researchers based on its ethnic and geographical diversity and its location between the Middle East and Europe. Future research in Turkey needs to look more deeply into the impact of women's autonomy on other health outcomes such reproductive decisions and utilization of health services.

5.4 Final Remarks

Bringing together consideration of diverse inputs of health production in the United States and Turkey serves two purposes. First, these studies highlight the importance of a nuanced understanding of the barriers to health care and good health outcomes. Gaining an understanding what is necessary for individuals to achieve good health is multidimensional and requires taking into consideration both individuals' economic and social context. Second, only by translating this understanding into empirically sound and thorough interventions will we be able to create effective and long-lasting change for populations most adversely affected by the inequities that result in poor health outcomes. These steps are important not only for the individuals themselves, but for society as a whole, as we cannot ignore the interconnectedness of all groups within a population.

APPENDICES

Appendix A: Regions

Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont
Midwest	Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

Appendix B: **Decomposing Differences in the First Moment**

After evaluating the standard normal function $F(x\beta)$ at the mean values the decomposition become:

$$\overline{ATC}_w - \overline{ATC}_h = [F(\bar{X}_w\beta_w) - F(\bar{X}_h\beta_w)] + [F(\bar{X}_h\beta_w) - F(\bar{X}_h\beta_h)] + R_m ,$$

where $R_m = \left[\overline{F(X_w\beta_w)} - \overline{F(X_h\beta_w)}\right] + \left[\overline{F(X_h\beta_w)} - \overline{F(X_h\beta_h)}\right] - [F(\bar{X}_w\beta_w) - F(\bar{X}_h\beta_w)] - [F(\bar{X}_h\beta_w) - F(\bar{X}_h\beta_h)]$.

In the second step, Yun (2004) uses a first order Taylor series expansion to approximate the characteristics effects and the coefficient effects around the $\bar{X}_w\beta_w$ and $\bar{X}_h\beta_h$. After Taylor expansion equation above is:

$$\overline{ATC}_w - \overline{ATC}_h = [(\bar{X}_w - \bar{X}_w)\beta_w]f(\bar{X}_w\beta_w) + \left[(\bar{\beta}_w - \bar{\beta}_h)\bar{X}_w\right]f(\bar{X}_h\beta_h) + R_m + R_t,$$

where $f(\bar{X}_h\beta_h), f(\bar{X}_w\beta_w), R_m$ *and* R_t are approximation residuals.

$R_m = \left[\overline{F(X_w\beta_w)} - \overline{F(X_h\beta_w)}\right] + \left[\overline{F(X_h\beta_w)} - \overline{F(X_h\beta_h)}\right] - [F(\bar{X}_w\beta_w) - F(\bar{X}_h\beta_w)] - [F(\bar{X}_h\beta_w) - F(\bar{X}_h\beta_h)]$,

$R_t = [F(\bar{X}_w\beta_w) - F(\bar{X}_h\beta_w)] + [F(\bar{X}_h\beta_w) - F(\bar{X}_h\beta_h)] - [(\bar{X}_w - \bar{X}_w)\beta_w]f(\bar{X}_w\beta_w) - \left[(\bar{\beta}_w - \bar{\beta}_h)\bar{X}_w\right]f(\bar{X}_h\beta_h)$, and $f(\bar{X}_h\beta_h) = \frac{F(\bar{X}_h\beta_h)}{d(\bar{X}_h\beta_h)}$, $f(\bar{X}_w\beta_w) = \frac{F(\bar{X}_w\beta_w)}{d(\bar{X}_w\beta_w)}$.

Using the information above a detailed decomposition can be written as:

$$\overline{ATC}_w - \overline{ATC}_h = \sum_{i=1}^{i=k} W_{\Delta x}^i \left[\overline{F(X_w\beta_w)} - \overline{F(X_h\beta_w)}\right] + \sum_{i=1}^{i=k} W_{\Delta\beta}^i \left[\overline{F(X_h\beta_w)} - \overline{F(X_h\beta_h)}\right]$$

where weights for the characteristics effect $W_{\Delta x}^i$ and weights for the coefficient effects $W_{\Delta\beta}^i$:

$$W_{\Delta x}^i = \frac{(\bar{X}_w^i - \bar{X}_h^i)\beta_w^i f(\bar{X}_w\beta_w)}{(\bar{X}_w - \bar{X}_h)\beta_w f(\bar{X}_w\beta_w)} = \frac{(\bar{X}_w^i - \bar{X}_h^i)\beta_w^i}{(\bar{X}_w - \bar{X}_h)\beta_h} \quad W_{\Delta\beta}^i = \frac{(\bar{\beta}_w^i - \beta_h^i)X_h^i f(\bar{X}_h\beta_h)}{(\bar{\beta}_w - \bar{\beta}_h)X_h f(\bar{X}_h\beta_h)} = \frac{(\bar{\beta}_w^i - \beta_h^i)X_h^i}{(\bar{\beta}_w - \bar{\beta}_h)X_h},$$

and $\sum_{i=1}^{i=k} W_{\Delta x}^i = \sum_{i=1}^{i=k} W_{\Delta\beta}^i = 1$.

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