PREDICTING CONTRACEPTIVE USE AMONG WOMEN AT RISK OF UNINTENDED PREGNANCY: DOES HAVING A USUAL SOURCE OF HEALTH CARE MATTER?

A Thesis

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by

Colleen Genora Germek

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Abstract

of

PREDICTING CONTRACEPTIVE USE AMONG WOMEN AT RISK OF UNINTENDED PREGNANCY: DOES HAVING A USUAL SOURCE OF HEALTH CARE MATTER?

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Statement of Problem

According to the most recent estimates from 2006, forty-nine percent of all pregnancies in the United States are unintended (Finer & Zolna, 2011). Contraceptives can greatly reduce the risk of unintended pregnancy, especially when used consistently and properly (CDC, 2012). Predicting contraceptive use and nonuse behaviors can help policymakers, community clinics, and other health care providers target the family planning needs of populations most at risk of unintended pregnancy.

Research regarding health care access suggests that having a usual source of health care has a positive effect on health outcomes. The purpose of this thesis is to explore the relationship between having a usual source of health care and contraceptive

use among women at risk of unintended pregnancy using logistic regression analysis. I also examine the interacting effect of health insurance status.

Sources of Data

Data for this analysis originated from the 2006-2010 National Survey of Family Growth (NSFG), specifically the Female Respondent File; however, after modifications, only data from Year 3 and Year 4 of the survey (July 2008-June 2010) was used. The NSFG is a nationwide in-person interview survey designed and administered by the Centers for Disease Control and Prevention, National Center for Health Statistics.

Conclusions Reached

Controlling for other factors, results from the logistic regression analysis found that among women at risk of unintended pregnancy, those who had a usual source of health care were 28.1% more likely to use contraceptives compared to those who did not have a usual source of health care. However, the interaction of health insurance status with having a usual source of health care was not a significant predictor of contraceptive use in my analysis.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Tables Page

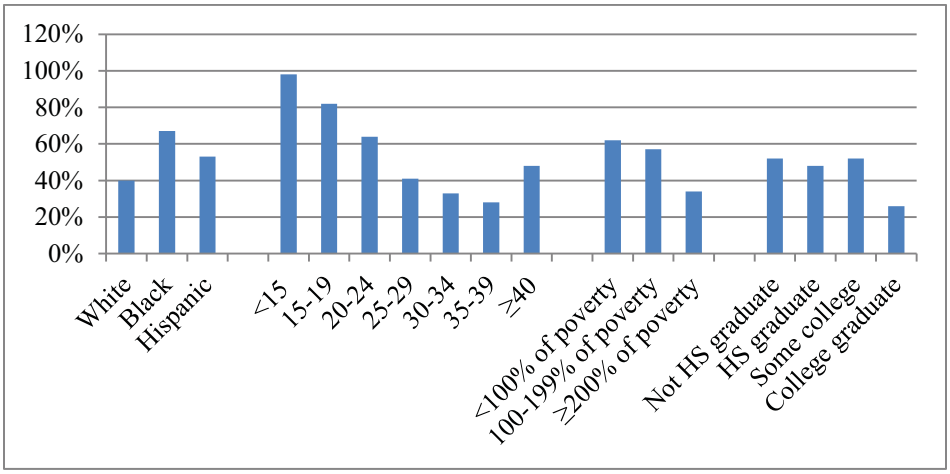
LIST OF FIGURES

Figures Page

CHAPTER 1: INTRODUCTION

Unintended pregnancy, as defined by the Centers for Disease Control and Prevention (CDC), is "a pregnancy that is either mistimed or unwanted at the time of conception" (2010). According to the most recent estimates from 2006, forty-nine percent of all pregnancies in the United States are unintended (Finer & Zolna, 2011). The percentage of pregnancies that are unintended also varies by state, from a low of 38% in Utah to a high of 65% in Mississippi. In California, an estimated 56% of all pregnancies are unintended (Finer & Kost, 2011). Among racial/ethnic minorities, the estimated percentage of pregnancies that are unintended is also higher than the national percentage, at 67% among black women and 54% of Hispanic women, whereas the percentage among white women is lower at 40%. Similar disparities in the proportion of unintended pregnancies also exist among poorer, younger, and less educated women as illustrated in Figure 1-1 below (Finer & Zolna, 2011).

Figure 1-1
Percentage of Unintended Pregnancies by Demographic and Socioeconomic Characteristics



*Percentage (%) of poverty is a calculation based on a family's household income, its size and composition compared to income thresholds set by the U.S. Census Bureau. A

> family is living at 100% of poverty if its total income equals its income threshold. However, a family is considered to be living in poverty only if its total income is below its threshold (U.S. Census Bureau, 2012a).

Research suggests that substantial economic and health related costs are associated with unintended pregnancy. Of the more than 2 million publicly funded births that occurred in 2006, more than 1 million (64%) were from unintended pregnancy, costing state governments $4.6 billion and the federal government $6.5 billion, for a total of $11.1 billion (Sonfield, et al., 2011). A similar study conservatively estimates the taxpayer burden for publicly-assisted care for women who experience unintended pregnancy, including abortion, fetal loss, birth, and the care for a resulting infant, ranges from $9.6-$12.6 billion annually (Monea & Thomas, 2011).

Adverse maternal behaviors that may jeopardize a woman's and her infant's health have been reported among women who experience unintended pregnancy. A study by Cheng, *et al.* (2009), comparing pregnancy intention (intended versus unwanted and mistimed) and maternal behavior suggests that women who give birth to an unwanted child are more likely to smoke cigarettes during and after pregnancy, use folic acid less than daily during pregnancy, put off prenatal care, discontinue breastfeeding before 8 weeks postpartum, and report postpartum depression. To a lesser degree, the study's results suggest that women who give birth to mistimed babies are more likely to take folic acid less than daily, put off prenatal care, and report postpartum depression. Similarly, Kost, Landry & Darroch (1998) found that, compared to women with an intended pregnancy, women who experienced a mistimed or unwanted pregnancy were less likely "to recognize their pregnancy in its earliest stages and to initiate early prenatal

care," and women who experienced a mistimed birth were "less likely to quit smoking than similar women with intended births" (p. 85).

RESEARCH QUESTION

Contraceptives can greatly reduce the risk of unintended pregnancy (CDC, 2012). Predicting their use and nonuse can help policymakers, community clinics, and other health care providers target the needs of populations most at risk of unintended pregnancy. Researchers agree with this position, as multiple analyses exist testing the affect that demographic, socioeconomic and behavior/attitude factors have on contraceptive use and nonuse. Outside the literature on contraceptive use, research regarding health care access suggests that having a usual source of health care (i.e. a place to go when sick, such as a doctor's office, clinic, etc.) has a positive effect on health outcomes. For example, DeVoe, *et al.* (2003), found that individuals with a usual source of health care (i.e. doctor's office, clinic, etc.), especially those who are simultaneously insured, were more likely to receive routine and preventive health care services. Results from a study by Sox, *et al.* (1998) suggests that when it comes to predicting lack of access to health care, lacking a regular physician outweighed health insurance status. Another study by Blewett, *et al.* (2008) found that, compared to adults without a usual source of care or a usual provider, those with both were the most likely to receive preventive health care. Adults with a usual source of care only were also more likely to receive preventive health care; however, the odds were less robust. Given the results from these studies, the purpose of this thesis is to explore the relationship between

having a usual source of health care and contraceptive use among women at risk of unintended pregnancy.

CONTRACEPTIVES: PREGNANCY PREVENTION AND USE

The advent of the birth control pill, "the pill" as it is commonly referred, and its subsequent approval by the Food and Drug Administration (FDA) in 1960 ushered in a new era of family planning that allowed women and families to more effectively time pregnancies or avoid them all together without abstaining from sex or seeking sterilization. Medical advances have since produced many other FDA approved hormonal contraceptives, such as the intra-uterine devise (IUD), injection, and cervical ring that are scientifically proven to be safe and highly effective at preventing pregnancy when used properly. In fact, "among all U.S. women at risk of an unintended pregnancy, the two-thirds who consistently and correctly practice contraception all year account for only 5% of unintended pregnancies" (Gold, *et al.,* 2009, p. 9). This statistic is not surprising given that contraceptive methods are 72% to more than 99% effective at preventing pregnancy when used properly (CDC, 2012).

Based on the high effectiveness of contraceptives at preventing pregnancy, it is not surprising that results from years 2006-2008 of the National Survey of Family Growth (NSFG) indicate nearly all women (99%) have used a contraceptive method at some point in their life. Still, among women "at risk" of unintended pregnancy, an estimated 11% currently were not using any type of contraceptive method at time of survey. The NSFG defines women at risk of unintended pregnancy as "women who are

not using contraception but who [have] had intercourse in the last 3 months, plus those who are having intercourse and are using contraception" (Mosher & Jones, 2010, p. 17).

ACCESS TO CONTRACEPTIVES

One of the goals of the CDC's Healthy People 2020 is to "increase the proportion of pregnancies that are intended" (CDC, n.d., p. 107). One way to achieve this is through improved access to family planning services and contraceptives. In the United States, policies governing private insurance coverage of contraceptives vary among states. Currently, 28 states require private insurance plans that offer prescription drug coverage "provide coverage of the full range of FDA-approved contraceptive drugs and devices," although emergency contraception is exempted in two states. Twenty states allow various exemptions or "refusals" to this coverage requirement, usually on grounds of religious objection (Guttmacher Institute, 2012).

Beginning August 1, 2012, access to birth control may increase for some women, as the U.S. Health and Human Services Agency recently issued a final rule requiring all non-grandfathered health plans provide the full range of FDA approved contraceptive methods and procedures at no cost (Health Resources and Services Administration, 2012). The policy stems from the Patient Protection and Affordable Care Act (ACA) of 2010, which focuses on preventive services, as well as the subsequent recommendation from the Institute of Medicine to redefine preventive services so that it would include a wider range of contraceptive methods for women (Institute of Medicine, 2011). However, the new policy has encountered strong resistance from church-affiliated

insurance plans, resulting in the issuance of a one-year exemption to such organizations (Pear, 2012).

Medicaid coverage of contraceptives for purposes of family planning also varies by state. In a 2009 Kaiser Family Foundation survey of state Medicaid programs examining family planning services, of the 44 respondents, 31 states and the District of Columbia always provide the full range of prescription contraceptives to beneficiaries, including oral contraceptives, IUDs, implants, injections, and diaphragms. Whereas, 12 of the state Medicaid programs only cover certain prescription contraceptives for family planning purposes under specific circumstances (Ranji & Salcanicoff, 2009).
Some states – 22 since the mid 1990s – have also opted to extend their Medicaid family planning services to women who might not qualify for full-scope Medicaid, thus increasing access to contraceptive coverage (Sonfield & Gold, 2011). A study on the cost-effectiveness of providing contraceptives under California's Medicaid expansion of family planning services – named Family PACT – suggests the program produces significant savings. In 2003, not only were an estimated 178,000 pregnancies prevented due to contraceptive services received through Family PACT, for every $1.00 spent on contraceptive services and supplies, $7.00 in cost savings was realized (Foster, *et al.,* 2009). Another study confirms the cost-effectiveness of public spending on family planning services to prevent unintended pregnancy, finding that overall "publicly supported family planning clinics save taxpayers $3.74 for every $1 that is spent providing contraceptive care" (Frost, Henshaw, & Sonfield, 2010).

THESIS ORGANIZATION

The remaining chapters of this thesis are as follows: Chapter 2 provides a review of the literature, focusing on individual level factors that affect contraceptive use. Chapter 3 discusses the research methods, data source and sample, specifically detailing the regression models and hypotheses developed for this analysis. Chapter 4 summarizes and provides an interpretation of the regression results, and Chapter 5 concludes with a discussion of the policy implications, limitations, and suggestions for future research.

CHAPTER 2: LITERATURE REVIEW

An abundance of research exists seeking to explain a woman's choice to use, or not to use, a contraceptive method to prevent pregnancy. Most prior research focuses on the relationship between contraceptive use and individual factors, such as socioeconomic, demographic, and behavioral/attitudinal characteristics. While researching for this thesis, I was unable to find prior studies regarding the effect of having a regular source of health care on contraceptive use to prevent pregnancy, specifically; however, as noted earlier, some research exists on the effect of having a regular source of health care on other health related outcomes. Additionally, several studies on factors associated with birth control included explanatory variables related to provider use and provider type.

This literature review focuses on the research regarding individual level demographic, socioeconomic, behavioral/attitudinal, and other factors that affect contraceptive use and nonuse among women. Specific individual factors covered include race/ethnicity, age, education, poverty, health insurance coverage, religion, sexual behavior, attitudes toward contraceptives and having children in the future, and medical provider use and provider type. All significant and non-significant findings discussed resulted from multivariate analyses that controlled for other explanatory factors.

DEMOGRAPHIC FACTORS

Race/Ethnicity

Numerous studies have analyzed the relationship between race/ethnicity and contraceptive use, nonuse and specific method choice. These studies reveal significant disparities in contraceptive nonuse among ethnic minority women compared to white

women. In multivariate analyses Frost, Singh & Finer (2007) and Upson *et al*. (2009) found that black women were about two times more likely not to use any contraceptive method compared to white women (1.94 and 2.2 respective odds ratios). Upson *et al.* also found that foreign-born women were four times more likely not to use any contraceptive method. Asian and Latino women were more likely not to use any contraceptive method in a multivariate analysis by Raine, Minnis, & Padian (2003), while in a study by Foster *et al.* (2004), Southeast Asian women were the ethnic group significantly more likely not to use contraceptives. In each study referenced, the relationship between race/ethnicity and nonuse was significant at the 95 percent confidence interval.

Research also suggests race/ethnicity predicts specific contraceptive method choice, like the pill and other prescription methods. Results from Frost & Darroch's (2008) multivariate analysis using odds ratios suggest Black and Asian women are roughly half as likely to use the pill as compared to white women. In the same study, Black and foreign-born Hispanic women were more likely (odds ration 1.61 and 2.26, respectively) to use a long lasting contraceptive method, such as injection, implant, ring and patch, compared to white women. Similarly, Culwell and Feinglass (2007) found that among women at risk of unintended pregnancy, being Black, Asian or another ethnic minority reduced likely prescription birth control usage by 40 percent at the 95 percent confidence level.

Age

Age is another consistent and statistically significant indicator of contraceptive use and nonuse. Specifically, in regression-based studies by Foster *et al.* (2004) and Frost, Singh & Finer (2007), women over 35 years old were more likely not to use any contraceptive method. The specific odds ratios at the 95 percent confidence level for women 35-39 and 40-44 years old in the Foster *et al.* (2004) study were 1.686 and 2.497, respectively. Whereas in the Frost, Singh and Finer (2007) study, women 35-40 were in excess of three times more likely not to use any contraceptive method (odds ratio 3.25, $p<.001$). Lastly, in their study on contraceptive use among women 34-44 years old and at risk of unintended pregnancy, Upson *et al.* (2009) found women ages 40-44 years old were twice as likely (odds ratio 2.0, $p<.05$) not to use a contraceptive method compared to the younger demographic group in the study.

Multivariate analyses also suggest that at certain ages, women are significantly more or less likely to use specific contraceptive methods. Among women at risk of unintended pregnancy, Culwell & Feinglass (2007) found that being 18-24 and 25-34 years old was significantly associated with a greater likelihood (2.1 and 1.6 respective odds ratios, $p<.05$) of prescription contraceptive use. Similarly, Frost & Derroch (2008) found women 35-44 years old had significantly decreased odds (odds ratio 0.53; $p<.01$) of using a long-acting method, such as injection, implant, ring and patch; however, they were significantly more likely to use condoms (odds ratio 1.57, $p<.05$) or other method (odds ratio 2.10, $p<.01$), such as withdrawal, spermicidal or intermittent abstinence.

SOCIOECONOMIC FACTORS

Education

Educational achievement is yet another contributing factor that may predict contraceptive use and nonuse, as well as specific method choice among women. Generally, the less education attained the higher the probability a contraceptive method is not used. Using college graduates as a reference, women in Frost, Singh & Finer's (2007) study with less than a high school education were nearly four times more likely not to use contraception (odds ratio 3.81, $p<.001$). Although, the probability of nonuse was lower among women with a high school degree, as well as with some college, the likelihood of contraceptive nonuse remained almost twice that of college graduates (odds ratio 1.98 and 1.99 respectively, $p<.05$). These findings concur with the Foster *et al.* (2004) study, which reported increased odds of contraceptive nonuse among women in California with a high school diploma or less (respective odds ratios 1.786 and 1.583, $p<.05$). Regarding specific method choice among contraceptive users, Frost & Derroch's (2008) study revealed a high school diploma or less, and only some college reduced the odds of oral contraceptive use (respective odds ratios 0.62 and 0.64, $p<.01$); however, those same educational backgrounds increased the likelihood a long-acting contraceptive was used (odds ratio 1.79, $p<.01$; odds ratio 1.94, $p<.001$).

Poverty

As previously discussed, unintended pregnancy is more prevalent among poor women. Despite this, several multivariate analyses found poverty level was not a significant factor in predicting contraceptive use or nonuse (Frost, Singh, & Finer, 2007;

Foster, *et al.,* 2004; Upson, *et al.,* 2010). Similarly, poverty level was not a significant determinant of specific contraceptive method choice in the multivariate analysis by Frost & Darroch, (2008).

BEHAVIORAL AND ATTITUDINAL FACTORS

Sexual Behavior

Studies suggest that a woman's sexual behavior can possibly predict contraceptive use and specific method choice, although results are mixed regarding number of sexual partners. Women reporting multiple sex partners within a six month time period, for example, were about half as likely to use any contraceptive (odds ratio 0.45; $p<.05$). Those that did use a contraceptive were almost three times more likely to use a barrier method such as condoms (odds ratio 2.76, $p<.01$) (Raine, Minnis & Padian, 2003). Frost & Darroch (2008) similarly report that women with multiple sex partners within the past year were less likely to use oral contraceptives (odds ratio 0.65, $p<.05$), but no significant relationship existed with condom or long-acting method usage. Contrary to the first report referenced in this subsection, Frost, Singh & Finer (2007) found that women reporting multiple sexual partners within a one year time period had reduced odds of nonuse (odds ratio 0.34; $p<.01$); however, having sexual intercourse equal to or less than once per month increased the likelihood of nonuse (odds ratio 1.97, $p<.05$).

Attitudinal Factors

Choosing to use any or a specific contraceptive method is a complex decision. Several studies that include individual attitudinal factors provide interesting insight into the psychological reasons why a woman may choose to use or not to use contraceptives.

As mentioned previously, studies indicate black women are less likely to use oral contraceptives compared to white women. Distrust stemming from historical practices and policies aimed at controlling reproduction among African Americans and the poor may offer one possible explanation for disparities in contraceptive use (Thorburn & Bogart, 2005). To test this relationship, Thorburn & Bogart (2005) analyzed African Americans' safety conspiracy beliefs regarding hormonal birth control and sterilization as an explanatory variable of current method usage. Controlling for demographic, socioeconomic, and other factors, the results indicated a decreased likelihood in hormonal contraceptive usage and sterilization among women with robust conspiracy beliefs (odds ratio 0.57, $p<.01$).

Not surprisingly, women who reported they would be happy to become pregnant and women who did not view avoiding pregnancy as important were more than twice as likely not to use any contraceptive method in Frost, Singh & Finer's (2007) study (respective odds ratios 2.09, 2.42; $p<.001$).

OTHER FACTORS

Health Insurance Coverage

Studies that included a variable measuring a woman's health insurance status produced mixed results. Using health insurance status as the key explanatory variable to predict prescription contraceptive use, Culwell and Feinglass' (2007) results indicated women without any health insurance – private or government funded – were significantly less likely to use prescription contraceptives (odds ratio 0.7, $p<.05$). Similarly, Nearns (2008) found that, among women age 18-24, being covered by private health insurance or

the government funded health program Medicaid increased the likelihood of prescription contraceptive use (respective odds ratio 3.31, p<.001; 3.08, p<.01), compared to those without any health insurance. Interestingly, Frost & Darroch (2008) found that women covered by Medicaid were less likely to use oral contraceptives (odds ratio 0.52, p<.01) and more likely to use condoms (odds ratio 1.50, p<.05) compared to privately insured women. Lack of health insurance, however, was not a significant determinant of specific contraceptive method choice. Insurance status – having public coverage or no insurance – was not a significant determinant of contraceptive use among Californian women in the Foster *et al.* (2008) study or among a national sample of women in the Frost, Singh & Finer (2007) study. Although it appears insurance status may predict specific method choice among contraceptive users, multivariate analyses suggest it may not predict overall contraceptive use versus nonuse.

Religion

Religion often plays a role in people's behavior choices; therefore, one could assume that religion might affect a woman's decision to use or not use contraceptives; however, like health insurance status, religion is not a consistent predictor of contraceptive use. For example, Raine, Minnis & Padian (2003) found that women raised with a religion were half as likely to use any contraceptive method (odds ratio 0.54; p<.05), but found no significant relationship between being raised with religion and specific method choice (barrier versus hormonal). In their study using religiosity as the key explanatory variable of contraceptive nonuse among women at risk of unintended

pregnancy, Kramer, Hogue & Gaydos (2007) found no significant relationship between religious membership and contraceptive nonuse in adult women.

Provider Use and Provider Type

While I found no research specifically examining the effect of having a usual source of health care on contraceptive use, several studies included variables regarding provider use and provider type. In the multivariate analysis by Frost, Singh & Finer (2007), women who reported no medical visit during the previous year were more than four times more likely not to use any contraceptive method compared to women who reported a medical visit with a private doctor in the past year. Usually seeing the same doctor or clinician, however, was not a significant predictor of contraceptive use. Similarly, women who reported not having a provider for contraceptive services were less likely to use the pill and long-acting methods (respective odds ratios 0.10, $p<.001$ and 0.33, $p<.01$), but more likely to use condoms (odds ration 4.71, $p<.001$) compared to women who relied on a private doctor (Frost & Darroch, 2008).

SUMMARY AND LIMITATIONS

To summarize, results from previous research suggest that race/ethnicity, age and education are the most consistent predictors of contraceptive use and nonuse. Attitude toward becoming pregnant also appears to be a significant predictor. Interestingly, among African American women, a strong conspiracy belief about contraception appears to have a negative effect on the use of hormonal contraceptive methods and sterilization. Research results, however, were mixed regarding sexual behavior, health insurance status religion, and provider use and provider type, suggesting that these factors may or may not

affect a woman's contraceptive use. In addition, although disparities in the proportion of unintended pregnancies exist among poorer women, poverty level does not appear to be a statistically significant predictor of contraceptive use or nonuse.

It is important to note that limitations exist in each study referenced. Small sample size may limit the ability to generalize the results in the study by Raine, Minnis & Padian (2003) and Thorburn & Bogart (2005), while the Foster, *et al.* (2004) sample was restricted to women in California, thus limiting the ability to generalize on a national scale. If reported at all R^2 was small, ranging from 0.0509 (Foster *et al*., 2004) to 0.275 (Frost, Singh & Finer, 2007). Since the models explained little variance, it is assumed other variables that might better explain contraceptive use and nonuse were omitted; however, many studies used secondary data, limiting the ability to incorporate additional or more detailed variables (Foster, et al., 2004; Upson, et al., 2009; Culwell & Feinglass, 2007; Kramer, Hogue & Gaydos, 2007).

CONCLUSION

In my search for existing literature on factors that affect contraceptive use among women, several factors showed to have an effect. Although not definitive, research results – both significant and not significant – provide valuable information to community health officials and policymakers, as well as provide a model for developing future analyses, such as this thesis. The purpose of this thesis is to test whether or not having a usual source of health care affects contraceptive use among women at risk of unintended pregnancy. Unfortunately, I was unable to find existing research specifically examining this relationship. However, as discussed in Chapter 1, studies suggest that

having a usual source of health care has a positive effect on access to health care services. These results provide a foundation for my research exploration of the effect of having a usual source of health care on contraceptive use among women at risk of unintended pregnancy. By testing this relationship, it is my intention to add to the existing literature on contraceptive use behavior. Although not my primary objective, this analysis may also contribute to the literature regarding health related outcomes associated with having a usual source.

CHAPTER 3: METHODOLOGY

The purpose of this thesis is to explore whether having a usual source of health care affects contraceptive use, specifically among women at risk of unintended pregnancy. To test this relationship, I chose to perform a multivariate regression analysis, allowing me to isolate the effect that having a usual source of health care has on contraceptive use, independent of the control variables (Studenmund, 2011). In addition to discussing the data used, this chapter outlines and details the regression's theoretical model, including the dependent variable, key explanatory variable, and other broad categories of independent variables anticipated to influence contraceptive use. As much as possible, I also hypothesize the directional effect (positive or negative) each independent variable will have on contraceptive use.

DATA SOURCE

All variables used in this regression analysis originated from the 2006-2010 National Survey of Family Growth (NSFG), specifically the Female Respondent File (U.S. Department of Health and Human Services, 2011). The NSFG is a nationwide in-person interview survey designed and administered by the Centers for Disease Control and Prevention, National Center for Health Statistics. For the 2006-2010 NSFG, a total of 22,682 men and women, age 15-44 were interviewed between June 2006 and June 2010 using a survey technique called computer assisted personal interviewing. For purposes of this thesis, however, I was only interested in female respondents, which, for all four years of the survey, totaled 12,279 – a response rate of 78% for women and 77% for female teenagers (CDC, 2011b).

DATA MODIFICATIONS

Before beginning the regression analysis, I made two data modifications to the 2006-2010 NSFG Female Respondent File. First, I dropped all respondent data from survey years one and two, since the specific survey question used to measure my dependent variable was asked to women beginning in year three of the survey. Consequently, my sample only includes survey data collected in July 2008-June 2010. Second, because I am only interested in contraceptive use behavior among women at risk of unintended pregnancy, I dropped all respondent data for women considered not at risk of unintended pregnancy. This included women who, at the time of survey, were pregnant, seeking pregnancy, postpartum, virgins, or were contraceptive non-users and had not engaged in sexual intercourse in the past three months, as well as women who were or their partners were sterile for non-contraceptive purposes (Mosher & Jones, 2010). These two modifications reduced the sample of women at risk of unintended pregnancy to 4,356. Despite the reduction, this is an acceptable sample size, and results should represent the general population.

DEPENDENT VARIABLE AND KEY EXPLANATORY VARIABLE

The dependent variable is birth control use among women age 15-44 who are at risk of unintended pregnancy, measured using a recoded variable (CONSTAT1) from the 2006-2010 NSFG, Female Respondent File that captures current contraceptive method use and non-use. I created a "Contraceptive Use" dummy variable coded one (1) if a woman reported currently using any contraceptive method and coded zero (0) if a woman reported not using any contraceptive method, yet had intercourse in the past three

months. This measure mirrors a previous one used in a report on birth control use trends published by the CDC's National Center for Health Statistics (Mosher & Jones, 2010). The report, which also used NSFG data, defines women at risk of unintended pregnancy as "all women who are not using contraception but who had had intercourse in the last 3 months, plus those who are having intercourse and are using contraception" (p. 16). Although birth control methods can greatly reduce the risk of unintended pregnancy, the risk still exists for all current contraceptive users due to possible method failure. Conversely, women who are not at risk for unintended pregnancy include those who are currently pregnant, postpartum or seeking pregnancy, as well as virgins, women who have not had intercourse in at least 3 months, and women (or their male partner) who are sterile for any reason other than to prevent pregnancy. As mentioned previously, I dropped women not at risk of unintended pregnancy from the sample.

The key explanatory variable is having a usual source of health care, measured using responses to the question: "Is there a place that you usually go to when you are sick or need advice about health?" (CDC, 2011a). I created a dummy variable coded one (1) if a woman responded "Yes" to this question and (0) if she responded "No." I hypothesize that having a usual source of health care will have a positive effect on contraceptive use. I have based this hypothesis on previous research discussed in Chapter 1 regarding the effect that having a usual source of health care has on other health related services.

THEORETICAL MODEL

To assure the regression results reflect a true relationship between the key explanatory variable and contraceptive use, I include control variables using the existing literature reviewed in Chapter 2 as a guide. Therefore, the complete theoretical model includes individual level socioeconomic inputs, health care access inputs, education inputs, family inputs, and behavioral inputs as the other broad causal variables that I expect have an effect on contraceptive use among women at risk of unintended pregnancy. The unit of analysis is the individual.

Listed below is the complete functional form of the theoretical model, the primary regression model. Table 3-1 provides the specific individual level variables used to proxy for each broad causal factor. Table 3-1 also includes hypothesized positive (+) and negative (-) relationships when possible, as well as a justification for each hypothesis. Relationships with uncertain directional effects are denoted with a question mark (?).

Theoretical Model:

Contraceptive Use = f (Usual Source of Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs)

Where:

Demographic Inputs = f [age, race/ethnicity]

Socioeconomic Inputs = f [% of poverty level, employment status, highest level of education completed]

Health Care Access Inputs = f [Metropolitan Statistical Area residence, health insurance coverage]

Family Inputs = f [marital status, # of children in household, religious affiliation]

Behavioral Inputs = f [# of sexual partners in lifetime, # of sexual partners in last 12 months]

Table 3-1 Variable Descriptions, Expected Effects and Justifications

Demographic Inputs	Expected Effect	Justification
Age dummy variables		
15-17 years	-	As the literature suggests, older women are less likely to use contraceptives.
18-24 years		
25-29 years		
30-34 years		
35-39 years		
40-45 years (reference)		
Race/Ethnicity dummy variables		
Non-Hispanic White (reference)		
Hispanic	-	Research suggests ethnic minority women are less likely to use contraceptives.
Non-Hispanic Black	-	
Non-Hispanic Other	-	

Socioeconomic Inputs	Expected Effect	Justification
% of Poverty Level	?	Poverty level (high or low) may have little effect because community clinics often provide free or reduced cost birth control, and health insurance often covers prescription methods at little to no additional cost. Additional uncertainty remains regarding the effect of lower poverty levels, as it may prevent a woman from getting to the place(s) that provide contraceptives. Previous research, however, has found the relationship insignificant.
Employment status dummy variables		
Working full-time (reference)		
Working part-time	?	Working part-time may or may not affect contraceptive use.
Not working	+	A woman currently not working may be seeking employment and an unintended pregnancy could disrupt short-term employment goals. Thus, the desire to prevent unintended pregnancy may be greater.
In school	+	Women who are currently in school may be more likely to use contraceptives, because an unintended pregnancy would likely disrupt their educational goals. Thus, the desire to prevent unintended pregnancy may be greater.
Keeping house	?	Keeping house and other working status may or may not affect contraceptive use.
Other working status	?	

Highest level of education completed dummy variables		
Grade 12 or less – no high school diploma	-	Previous research suggests that the more education a woman has, the more likely she is to use contraceptives, and vice versa.
High school graduate or GED (reference)		
Some college-no degree	+	
Associate's degree	+	
Bachelor's degree or higher	+	
Healthcare Access Inputs	**Expected Effect**	**Justification**
Metropolitan Statistical Area (MSA)* residence dummy variables		
MSA, Central City (reference)		
MSA, Suburb	-	Women living in less urbanized areas may have reduced access to sources that provide contraceptives (i.e. pharmacy, clinic, doctor's office, or drug store).
MSA, Non-Metropolitan	-	
Health insurance dummy variables		
Single-service plan, Indian Health Plan, or no insurance (reference)		
Private insurance	?	Research results varied; therefore having health insurance or coverage may or may not have an impact on contraceptive use.
Public insurance	?	

Family Inputs	Expected Effect	Justification
Marital status dummy variables		
Married (reference)		
Unmarried, but cohabitating	+	There may be a greater desire to avoid the economic impact, as well as social/familial stigmas attached to unintended pregnancy or motherhood outside marriage. Instability from marital separation may also increase the likelihood a woman uses contraceptive.
Widowed, Divorced or Separated	+	
Never Married	+	
# of children in household dummy variables		
0 children (reference)		
1 child	-	Everyone's ideal family size differs; however, having more children in the household suggests a woman may have reached her ideal family size and may have a stronger desire to prevent having more children. The strong desire to prevent unintended pregnancy may not be present in women with fewer children. Thus, I expect women with more children in their household are more likely to use contraceptives, and vice versa.
2 children	-	
3 children	+	
4 or more children	+	
Current religious affiliation dummy variables		
No religious affiliation (reference)		
Catholic	?	Research is inconclusive regarding the effect of being raised with a religion on contraceptive use; therefore, current religious affiliation may or may not affect contraceptive use as well.
Protestant	?	
Other Religion	?	

Behavioral Inputs	Expected Effect	Justification
# of opposite-sex partners in lifetime dummy variables		
1 partner	?	Research on the directional effect of number of sex partners in the past 12 months was mixed; therefore, number of sex partners in lifetime may positively or negatively affect contraceptive use.
2-5 partners (reference)		
6-9 partners	?	
10-19 partners	?	
20 or more partners	?	
# of sex partners in past 12 months dummy variables		
None	?	Research on the directional effect of number of sex partners in the past 12 months varied; therefore, the directional effect is uncertain.
1 partner (reference)		
2 partners	?	
3 or more partners	?	

*The Office of Management and Budget annually defines Metropolitan Statistical Areas for research purposes. According to the U.S. Census Bureau, "The general concept of a metropolitan area is that of a large population nucleus, together with adjacent communities having a high degree of social and economic integration with that core. Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units" (U.S. Census Bureau, n.d.).

INTERACTION TERMS

As discussed in Chapter 1, DeVoe, *et al.* (2003) found that individuals who had a usual source of health care (i.e. doctor's office, clinic, etc.) and were simultaneously insured were more likely to receive routine and preventive health care services. Sox, *et al.* (1998) found that lack of a regular physician is a better predictor of lack of access to

health care than health insurance status. Given these results, I am also interested in exploring the simultaneous effect of having a usual source of health care and health insurance status on contraceptive use among women at risk of unintended pregnancy. To do this I created a dummy variable coded one (1) if a woman reported having any health insurance (public or private) and coded zero (0) if a woman reported not having any health insurance. I developed two additional regression models, using the theoretical model described above and included an "if qualifier" to measure the simultaneous effect of a specified condition on the whole model – in this case having health insurance or not having health insurance. Hypothesized relationships are all uncertain, as none of the research reviewed provides a guideline to suggest and justify an expected effect on contraceptive use. The interaction models are as follows:

Interaction Model 1

Contraceptive Use = f (Usual Source of Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs) *if* covered by any health insurance

Interaction Model 2

Contraceptive Use = f (Usual Source of Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs) *if* not covered by any health insurance

Where, for both models:

Demographic Inputs = f [age, race/ethnicity]

Socioeconomic Inputs = f [% of poverty level, employment status, highest level of education completed]

Health Care Access Inputs = f [Metropolitan Statistical Area residence]

Family Inputs = f [marital status, # of children in household, religious affiliation]

Behavioral Inputs = f [# of sexual partners in lifetime, # of sexual partners in last 12 Months

CONCLUSION

In summary, I developed one theoretical regression model to test the relationship between having a usual source of health care and contraceptive use among women at risk of unintended pregnancy. In addition to the key explanatory variable, Usual Source of Health Care, the complete theoretical model controls for demographic, socioeconomic, familial, and behavioral factors. Thirty-eight (38) variables serve as proxies for these broad causal inputs. I also developed two interaction models that include health insurance as a qualifying condition. By including health insurance status as a qualifying condition rather than creating a single interaction variable, health insurance status interacts with all variables in the model.

CHAPTER 4: RESULTS

In the previous three chapters, I laid the framework for this thesis. Chapter 4 presents the multivariate regression results for the theoretical model and two interaction models described in Chapter 3. I conducted the analysis using the statistical software program, Stata (StataCorp, 2011). First, however, I report the descriptive statistics and discuss the correlation coefficients, followed by a discussion of the regression technique used. Further discussion of the policy implications based on the results follows in Chapter 5.

DESCRIPTIVE STATISTICS

Table 4-1 summarizes the descriptive characteristics of the data sample, including the total number of observations, mean, standard deviation, and minimum and maximum values for the dependent variable and each independent variable. After running a summary of the data, several figures stand out as noteworthy. Over 88% of women surveyed report currently using some form of contraceptive, and about 85% have a usual source of health care. The latter statistic aligns well with the most recent national average from 2008-2009, which estimated about 87% of adult females in the United States had a usual source of health care (National Center for Health Statistics, 2012). No one age group dominates the sample; however, 24% of women are between 18 and 24 years old. The percentages of respondents in the sample who are African American (20%) or Hispanic (23%) are above the national levels of 12.6% and 16.3% respectively (U.S. Census Bureau, 2012b); however, in this case, the oversampling of ethnic minority groups is not so severe to create concern about sample bias.

Table 4-1 Descriptive Statistics

Variable	# of Observations	Mean	Standard Deviation	Minimum	Maximum
Contraceptive User	4356	0.886	0.317	0	1
Has Usual Source of Health Care	4354	0.847	0.360	0	1
15-17 years old	4356	0.042	0.201	0	1
18-24 years old	4356	0.240	0.427	0	1
25-29 years old	4356	0.210	0.407	0	1
30-34 years old	4356	0.185	0.388	0	1
35-39 years old	4356	0.174	0.379	0	1
40-45 years old (reference)	4356	0.149	0.356	0	1
Non-Hispanic White (reference)	4356	0.516	0.500	0	1
Hispanic	4356	0.232	0.422	0	1
Non-Hispanic Black	4356	0.203	0.402	0	1
Non-Hispanic Other	4356	0.049	0.216	0	1
% Poverty level	4356	214.361	147.606	6	500
Working full-time (reference)	4356	0.426	0.495	0	1
Working part-time	4356	0.190	0.392	0	1
Other working status	4356	0.076	0.265	0	1
Not working	4356	0.076	0.265	0	1
In school	4356	0.070	0.255	0	1
Keeping house	4356	0.163	0.370	0	1
≤12th grade no diploma	4356	0.238	0.426	0	1
High school diploma or GED (reference)	4356	0.255	0.436	0	1
Some college-no degree	4356	0.208	0.406	0	1
Associate's degree	4356	0.078	0.269	0	1
Bachelor's degree or higher	4356	0.221	0.415	0	1
MSA, Metropolitan (reference)	4356	0.419	0.493	0	1

Variable	# of Observations	Mean	Standard Deviation	Minimum	Maximum
MSA, Suburb	4356	0.472	0.499	0	1
MSA, Non-Metropolitan	4356	0.109	0.312	0	1
Private insurance	4356	0.545	0.498	0	1
Public insurance	4356	0.221	0.415	0	1
No insurance (reference)	4356	0.233	0.423	0	1
Married (reference)	4356	0.365	0.481	0	1
Unmarried, but cohabitating	4356	0.156	0.363	0	1
Widowed, Divorced or Separated	4356	0.109	0.312	0	1
Never Married	4356	0.370	0.483	0	1
0 children in household (reference)	4356	0.407	0.491	0	1
1 child in household	4356	0.192	0.394	0	1
2 children in household	4356	0.230	0.421	0	1
3 children in household	4356	0.114	0.317	0	1
4 children in household	4356	0.038	0.190	0	1
≥ 5 children in household	4356	0.020	0.138	0	1
No religion (reference)	4356	0.221	0.415	0	1
Catholic	4356	0.244	0.430	0	1
Protestant	4356	0.474	0.499	0	1
Other Religion	4356	0.060	0.238	0	1

Variable	# of Observations	Mean	Standard Deviation	Minimum	Maximum
0 opposite sex partners in past 12 months	4274	0.051	0.220	0	1
1 opposite sex partner in past 12 months	4274	0.777	0.416	0	1
2 opposite sex partners in past 12 months	4274	0.107	0.310	0	1
≥ 3 opposite sex partners in past 12 months (reference)	4274	0.065	0.246	0	1
1 opposite sex partner in lifetime	4274	0.198	0.398	0	1
2-5 opposite sex partners in lifetime (reference)	4274	0.431	0.495	0	1
6-9 opposite sex partners in lifetime	4274	0.167	0.373	0	1
10-19 opposite sex partners in lifetime	4274	0.126	0.332	0	1
≥ 20 opposite sex partners in lifetime	4274	0.078	0.269	0	1

CORRELATION COEFFICIENTS

Appendix A provides a matrix of the correlation coefficients and significance levels for each independent variable in the regression model. The correlation coefficient is "a measure of the strength and direction of the linear relationship between two variables" (Studenmund, 2011, p. 52). This step is important in any regression-based analysis as it one method to test for multicollinearity. In other words, it tests if any independent variables are linear functions of each other, or perfectly correlated. Upon review of the correlation coefficients, multicollinearity does not appear to be a concern,

as all coefficients equal less than 0.8. Although not perfectly correlated, several variables produced relatively large, significant correlation coefficients that deserve noting. They include, percent of poverty and having less than a high school diploma (-.316), percent of poverty and having a bachelor's degree or higher (.416), percent of poverty and having private insurance (.504), percent of poverty and having public insurance (-.368), and having private insurance and having a bachelor's degree or higher (.320).

CHOOSING THE APPROPRIATE REGRESSION METHOD

For purposes of this thesis, I chose to perform a logistic regression analysis using the binomial logit model, which uses maximum likelihood to estimate logit coefficients, rather than a more traditional linear probability estimation technique that uses Ordinary Least Squares (OLS). Logistic regression is more appropriate than a linear regression when the regression model's dependent variable is dichotomous (i.e. a dummy variable) because it avoids the "unboundedness" problem present in the alternative linear probability estimation technique using OLS. In other words, although the dependent variable only takes on a value of zero or one, in a linear probability model "the expected value of the dependent variable is not limited by zero and one" (Studenmund, 2011, p. 450). Thus, the OLS results are essentially meaningless. Moreover, OLS is the less desirable technique when the dependent variable is dichotomous because its goodness of fit measure, adjusted R^2, is "not an accurate measure of the regression's overall fit" (p.450). Conversely, the logistic regression method calculates a "pseudo-R^2" to measure overall fit of the regression model. Pseudo-R^2 is the "average of the percentage of ones

explained correctly and the percentage of zeroes explained correctly" (Studenmund, 2011, p. 437).

REPORTING THE REGRESSION RESULTS

In the following section, I report the logistic regression results for the theoretical model and two interaction models described in Chapter 3. The full results are in Tables 4-2 through 4-4 below and include the following: 1) estimated regression coefficients (β) and the corresponding standard error; 2) Variance Inflation Factor (VIF) results; 3) Odds Ratio [EXP (β)]; and, 4) the percentage change in odds. Furthermore, I identify statistically significant results at the 90%, 95%, and 99% confidence level with asterisks, as well as report total observations (N) and pseudo R^2 for each regression model.

In logistic regression, the regression coefficient (β) is the effect of the independent variable on the logarithm of the likelihood of, in this case, contraceptive use compared to contraceptive non-use (Pevalin & Robson, 2009, p. 305). In order to interpret these results, logistic regression converts the estimated coefficients into odds ratios [EXP (β)], which can then be translated into a percentage change in odds using the formula [EXP (β) – 1]*100. Odds ratios less than 1 indicate a negative effect, while odds ratios greater than 1 indicate a positive effect.

As mentioned earlier in this chapter, testing for multicollinearity is an important step in any regression-based analysis. An additional test for multicollinearity, specifically measuring its severity, is the variance inflation factor (VIF) for independent variables. Multicollinearity is considered severe when the VIF score is greater than five (5) (Studenmund, 2011, p. 260). Typically, the VIF test is available only when conducting a

linear regression using OLS; however, I downloaded the collin.ado program, written by UCLA Academic Technology Services, which allowed me to detect multicollinearity among my independent variables (Ender, 2010).

LOGISTIC REGRESSION RESULTS

Theoretical Model

Contraceptive Use = f (Usual Source of Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs)

Controlling for other variables, the logistic regression results of the theoretical model find that, among women at risk of unintended pregnancy, those who have a usual source of health care are 28.1% more likely to be a contraceptive user compared to those who do not have a usual source of health care. Not only is the directional relationship of the key explanatory variable as I hypothesized, it is statistically significant at the 90% confidence level. Severe multicollinearity does not appear to be present in the model, as indicated by VIFs equaling less than five (5) for each independent variable.

The model's overall goodness of fit, as measured by pseudo R^2, is .0628. This means the independent variables correctly predicted contraceptive use only 6.28% of the time. The small R^2 indicates the model's overall goodness of fit is weak and there are likely omitted explanatory variables.

Table 4-2 Regression Results, Theoretical Model

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Has Usual Source of Care	0.2477*	0.1325	1.14	1.2811	28.1%
15-17 years old	-0.2383	0.3074	1.73	0.7880	-21.2%
18-24 years old	0.1991	0.2025	2.82	1.2203	22.0%
25-29 years old	0.0409	0.1871	2.10	1.0418	4.2%
30-34 years old	-0.0595	0.1896	1.94	0.9423	-5.8%
35-39 years old	0.0240	0.1930	1.84	1.0243	2.4%
40-45 years old (reference)	Reference	-	-	-	-
Non-Hispanic White (reference)	Reference	-	-	-	-
Hispanic	-0.2428*	0.1500	1.61	0.7844	-21.6%
Non-Hispanic Black	-0.4427***	0.1416	1.51	0.6423	-35.8%
Non-Hispanic Other	-0.6285***	0.2115	1.11	0.5334	-46.7%
% Poverty level	-0.0001	0.0004	1.85	0.9999	0.0%
Working full-time (reference)	Reference	-	-	-	-
Working part-time	-0.1055	0.1416	1.27	0.8998	-10.0%
Other working status	-0.0926	0.1941	1.16	0.9116	-8.8%
Not working	-0.0659	0.1907	1.19	0.9362	-6.4%
In school	-0.0434	0.2083	1.24	0.9576	-4.2%
Keeping house	-0.0245	0.1646	1.40	0.9758	-2.4%
≤12th grade no diploma	0.0943	0.1456	1.73	1.0989	9.9%
High school diploma or GED (reference)	Reference	-	-	-	-
Some college-no degree	0.3361**	0.1492	1.49	1.3995	40.0%
Associate's degree	0.6436***	0.2455	1.26	1.9034	90.3%
Bachelor's degree or higher	0.0721	0.1621	1.86	1.0748	7.5%
MSA, Metropolitan (reference)	Reference	-	-	-	-
MSA, Suburb	-0.0847	0.1076	1.22	0.9188	-8.1%
MSA, Non-Metropolitan	0.1444	0.1924	1.27	1.1554	15.5%
Private insurance	0.3858***	0.1394	2.16	1.4708	47.1%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Public insurance	0.2583*	0.1456	1.72	1.2947	29.5%
No insurance (reference)	Reference	-	-	-	-
Married (reference)	Reference	-	-	-	-
Unmarried, but cohabitating	0.1328	0.1871	1.48	1.1420	14.2%
Widowed, Divorced or Separated	-0.4450**	0.1922	1.43	0.6408	-35.9%
Never Married	-0.8023***	0.1616	2.47	0.4483	-55.2%
0 children in household (reference)	Reference	-	-	-	-
1 child in household	-0.0915	0.1394	1.42	0.9126	-8.7%
2 children in household	0.4539***	0.1628	1.68	1.5744	57.4%
3 children in household	0.1546	0.1954	1.57	1.1672	16.7%
4 children in household	0.5507*	0.3216	1.24	1.7345	73.5%
≥ 5 children in household	-0.0653	0.3612	1.16	0.9367	-6.3%
No religion (reference)	Reference				
Catholic	0.1835	0.1588	1.88	1.2014	20.1%
Protestant	0.0743	0.1302	1.83	1.0771	7.7%
Other Religion	0.0924	0.2346	1.30	1.0968	9.7%
0 opposite sex partners in past 12 months	1.1487***	0.3598	1.95	3.1541	215.4%
1 opposite sex partner in past 12 months	0.1446	0.1953	3.58	1.1556	15.6%
2 opposite sex partners in past 12 months	0.0914	0.2123	2.46	1.0957	9.6%
≥ 3 opposite sex partners in past 12 months (reference)	Reference	-	-	-	-
1 opposite sex partner in lifetime	0.1998	0.1509	1.32	1.2211	22.1%
2-5 opposite sex partners in lifetime (reference)	Reference	-	-	-	-
6-9 opposite sex partners in lifetime	0.3790***	0.1536	1.23	1.4608	46.1%
10-19 opposite sex partners in lifetime	-0.1119	0.1534	1.25	0.8941	-10.6%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
≥ 20 opposite sex partners in lifetime	0.4669**	0.2162	1.30	1.5950	59.5%
Constant	1.5933	0.3615	N/A	4.9197	392.0%

N=4,272
Pseudo R^2=.0628
*<p.10
**<p.05
***<p.01

Interaction Model 1

Contraceptive Use = f (Usual Source for Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs) *if* covered by any health insurance

Interaction Model 1 is one of two interaction models that include health insurance status as a qualifying condition. By including health insurance status as a qualifying condition rather than creating a single interaction variable, health insurance status independently interacts with all variables in the model. In Interaction Model 1, the specific qualifying condition is having health insurance. Controlling for other variables, the logistic regression results find that, among women at risk of unintended pregnancy, those who simultaneously have a usual source of health care and health insurance are 24.9% more likely to be a contraceptive user, compared to those who do not have a usual source of health care or health insurance. However, this relationship is not statistically significant. Severe multicollinearity does not appear to be present in the model, as indicated by VIFs equaling less than five (5) for each independent variable.

The pseudo R^2 for Interaction Model 1 is .0596, which is slightly lower than the pseudo R^2 for Model A. In this case, the independent variables, simultaneously

interacting with having health insurance, correctly predicted contraceptive use 5.96% of the time. Again, the small R^2 indicates overall goodness of fit is weak and there are likely omitted explanatory variables.

Table 4-3 Regression Results, Interaction Model 1

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Has Usual Source of Care	0.2222	0.1874	1.03	1.2488	24.9%
15-17 years old	-0.4323	0.3523	1.92	0.6490	-35.1%
18-24 years old	0.0870	0.2457	2.84	1.0909	9.1%
25-29 years old	0.0072	0.2206	2.04	1.0072	0.7%
30-34 years old	-0.1307	0.2208	1.87	0.8775	-12.3%
35-39 years old	-0.1275	0.2216	1.78	0.8803	-12.0%
40-45 years old (reference)	Reference	-	-	-	-
Non-Hispanic White (reference)	Reference	-	-	-	-
Hispanic	-0.1896	0.1776	1.4	0.8273	-17.3%
Non-Hispanic Black	-0.4168***	0.1661	1.5	0.6591	-34.1%
Non-Hispanic Other	-0.7501***	0.2456	1.1	0.4723	-52.8%
% Poverty level	-0.0001	0.0005	1.75	0.9999	0.0%
Working full-time (reference)	Reference	-	-	-	-
Working part-time	-0.1654	0.1716	1.25	0.8475	-15.2%
Other working status	0.0396	0.2299	1.16	1.0403	4.0%
Not working	-0.1834	0.2374	1.15	0.8324	-16.8%
In school	-0.1131	0.2392	1.28	0.8931	-10.7%
Keeping house	-0.1273	0.1949	1.31	0.8805	-12.0%
≤12th grade no diploma	0.2380	0.1869	1.75	1.2687	26.9%
High school diploma or GED (reference)	Reference	-	-	-	-
Some college-no degree	0.6100***	0.1857	1.53	1.8404	84.0%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Associate's degree	0.5230**	0.2585	1.29	1.6871	68.7%
Bachelor's degree or higher	0.1182	0.1823	1.95	1.1255	12.5%
MSA, Metropolitan	-	-	-	-	-
MSA, Suburb	-0.1653	0.1282	1.23	0.8476	-15.2%
MSA, Non-Metropolitan	0.0711	0.2213	1.28	1.0736	7.4%
Married (reference)	Reference	-	-	-	-
Unmarried, but cohabitating	0.3306	0.2485	1.39	1.3918	39.2%
Widowed, Divorced or Separated	-0.5347**	0.2262	1.39	0.5858	-41.4%
Never Married	-0.7634***	0.1888	2.47	0.4661	-53.4%
0 children in household (reference)	Reference	-	-	-	-
1 child in household	-0.2089	0.1661	1.44	0.8115	-18.9%
2 children in household	0.3589*	0.1947	1.71	1.4318	43.2%
3 children in household	-0.0624	0.2317	1.55	0.9395	-6.1%
4 children in household	0.8803**	0.4522	1.25	2.4117	141.2%
≥ 5 children in household	-0.2381	0.4247	1.15	0.7881	-21.2%
No religion (reference)	Reference	-	-	-	-
Catholic	-0.0561	0.1853	1.76	0.9455	-5.5%
Protestant	-0.0203	0.1568	1.8	0.9799	-2.0%
Other Religion	0.0861	0.2818	1.29	1.0899	9.0%
0 opposite sex partners in past 12 months	1.1236***	0.4420	2	3.0758	207.6%
1 opposite sex partner in past 12 months	0.0044	0.2427	3.67	1.0044	0.4%
2 opposite sex partners in past 12 months	-0.0022	0.2642	2.53	0.9978	-0.2%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
≥ 3 opposite sex partners in past 12 months (reference)	Reference	-	-	-	-
1 opposite sex partner in lifetime	0.1232	0.1751	1.32	1.1311	13.1%
2-5 opposite sex partners in lifetime (reference)	Reference	-	-	-	-
6-9 opposite sex partners in lifetime	0.3070*	0.1791	1.23	1.3594	35.9%
10-19 opposite sex partners in lifetime	-0.2306	0.1816	1.26	0.7940	-20.6%
≥ 20 opposite sex partners in lifetime	0.1950	0.2655	1.25	1.2153	21.5%
Constant	2.3254	0.4525	N/A	10.2309	923.1%

N=3,262
Pseudo R^2=.0596
*<p.10 **<p.05 ***<p.01

Interaction Model 2

Contraceptive Use = f (Usual Source for Health Care, Demographic Inputs, Socioeconomic Inputs, Health Care Access Inputs, Family Inputs, Behavioral Inputs) *if* not covered by any health insurance

Interaction Model 2 is the other interaction model that includes health insurance status as a qualifying condition. Its specific qualifying condition is *not* having health insurance. Controlling for other variables, the logistic regression results find that, among women at risk of unintended pregnancy, those who simultaneously have a usual source of health care and are not covered by health insurance are 26% more likely to be a contraceptive user, compared to those who do not have a usual source of health care and have health insurance. However, this relationship is *not* statistically significant. Severe

multicollinearity does not appear to be present in the model, as indicated by VIFs equaling less than five (5) for each independent variable.

Interaction Model 2's overall goodness of fit, as measured by pseudo R^2, is slightly higher than the other two models at .1163. The independent variables, simultaneously interacting with not having health insurance, correctly predicted contraceptive use 11.63% of the time. Pseudo R^2 is still quite small, indicating overall goodness of fit is weak and there are likely omitted explanatory variables.

Table 4-4 Regression Results, Interaction Model 2

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Has Usual Source of Care	0.2310	0.2018	1.08	1.2598	26.0%
15-17 years old	-0.3024	0.9035	1.21	0.7391	-26.1%
18-24 years old	0.3719	0.3789	2.98	1.4505	45.1%
25-29 years old	0.1113	0.3736	2.52	1.1177	11.8%
30-34 years old	0.0338	0.3817	2.3	1.0344	3.4%
35-39 years old	0.3561	0.4027	2.15	1.4277	42.8%
40-45 years old (reference)	Reference	-	-	-	-
Non-Hispanic White (reference)	Reference	-	-	-	-
Hispanic	-0.6209**	0.3019	2.38	0.5375	-46.3%
Non-Hispanic Black	-0.4853*	0.2849	1.57	0.6155	-38.4%
Non-Hispanic Other	-0.2887	0.4401	1.2	0.7492	-25.1%
% Poverty level	0.0003	0.0009	1.34	1.0003	0.0%
Working full-time (reference)	Reference	-	-	-	-
Working part-time	-0.1142	0.2600	1.36	0.8921	-10.8%
Other working status	-0.6799*	0.3910	1.16	0.5067	-49.3%
Not working	-0.0401	0.3282	1.26	0.9607	-3.9%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
In school	-0.1329	0.4607	1.18	0.8756	-12.4%
Keeping house	-0.0811	0.3067	1.52	0.9221	-7.8%
≤12th grade no diploma	-0.1427	0.2533	1.67	0.8670	-13.3%
High school diploma or GED (reference)	Reference	-	-	-	-
Some college-no degree	-0.2105	0.2703	1.44	0.8102	-19.0%
Associate's degree	2.0682**	1.0387	1.19	7.9104	691.0%
Bachelor's degree or higher	0.3249	0.3834	1.35	1.3839	38.4%
MSA, Metropolitan (reference)	Reference	-	-	-	-
MSA, Suburb	0.1265	0.2094	1.23	1.1348	13.5%
MSA, Non-Metropolitan	0.3484	0.4109	1.28	1.4168	41.7%
Married (reference)	Reference	-	-	-	-
Unmarried, but cohabitating	-0.4054	0.3231	1.64	0.6667	-33.3%
Widowed, Divorced or Separated	-0.5465	0.3859	1.63	0.5790	-42.1%
Never Married	-1.2360***	0.3401	2.55	0.2906	-70.9%
0 children in household (reference)	Reference	-	-	-	-
1 child in household	0.1064	0.2656	1.36	1.1122	11.2%
2 children in household	0.6067**	0.3100	1.68	1.8344	83.4%
3 children in household	0.5598	0.3764	1.72	1.7503	75.0%
4 children in household	0.1848	0.5047	1.26	1.2029	20.3%
≥ 5 children in household	0.2213	0.7028	1.21	1.2477	24.8%
No religion (reference)	Reference	-	-	-	-
Catholic	0.8843***	0.3194	2.36	2.4213	142.1%
Protestant	0.2194	0.2475	1.96	1.2454	24.5%

Variable	β	Standard Error	VIF	Odds Ratio [EXP (β)]	% Change in Odds
Other Religion	0.0388	0.4459	1.4	1.0396	4.0%
0 opposite sex partners in past 12 months	1.0342	0.6463	1.89	2.8128	181.3%
1 opposite sex partner in past 12 months	0.2930	0.3551	3.51	1.3404	34.0%
2 opposite sex partners in past 12 months	0.2217	0.3796	2.33	1.2482	24.8%
≥ 3 opposite sex partners in past 12 months (reference)	Reference	-	-	-	-
1 opposite sex partner in lifetime	0.4160	0.3115	1.4	1.5159	51.6%
2-5 opposite sex partners in lifetime (reference)	Reference	-	-	-	-
6-9 opposite sex partners in lifetime	0.5219*	0.3183	1.3	1.6853	68.5%
10-19 opposite sex partners in lifetime	0.1597	0.3035	1.3	1.1732	17.3%
≥ 20 opposite sex partners in lifetime	0.9755***	0.3795	1.49	2.6524	165.2%
Constant	1.3478	0.6617	N/A	3.8489	284.9%

N=1,010
Pseudo R^2=.1163
*<p.10 **<p.05 ***<p.01

TESTING AND CORRECTING FOR ERRORS

Testing for heteroskedasticity is an important step when employing a linear regression that uses OLS. In OLS, Heteroskedasticity is "the violation of Classical Assumption V, which states that the observations of the error term are drawn from a distribution with a constant variance" (Studenmund, 2011, p. 337). This thesis used logistic regression analysis, which estimates coefficients using maximum likelihood

rather than OLS; therefore, it was not possible to test for heteroskedasticity. As mentioned earlier in this chapter, upon review of the correlation coefficient matrix, multicollinearity does not appear to be a concern. Further diagnosis showed no evidence that severe multicollinearity exists, as VIFs were less than five in all regression models. Based on these two factors, corrections were not necessary.

CHAPTER 5: CONCLUSION

In this final chapter, I discuss policy implications of the regression results and the limitations of the analysis, followed by suggestions for future research.

POLICY IMPLICATIONS

In this thesis, I have explored the relationship between having a usual source of health care and contraceptive use among women at risk of unintended pregnancy. Results from the logistic regression analysis of my theoretical model, which did not contain any interaction terms, found that among women at risk of unintended pregnancy, those who had a usual source of health care were 28.1% more likely to use contraceptives compared to those who did not have a usual source of health care. While I found no comparable study that measured this specific relationship, my results corroborate previous research that suggests having a usual source of care is beneficial to the receipt of other health care services. However, unlike the study by DeVoe, *et al.* (2003) that suggests the combination of a usual source of care and health insurance results in more robust positive health outcomes, the interaction of health insurance status with a usual source of care was not a significant predictor of contraceptive use in my analysis.

Contraceptives can greatly reduce the risk of unintended pregnancy, especially when used consistently and properly (CDC, 2012). Predicting their use and nonuse can help policymakers, community clinics, and other health care providers target the family planning needs of populations most at risk of unintended pregnancy. The findings of this analysis add to the existing literature by suggesting that having a usual source of health care is a determinant of contraceptive use among women at risk of unintended pregnancy,

which may ultimately result in realized family planning needs and fewer unintended pregnancies. This subsequently implies that women at risk of unintended pregnancy who are without a usual source of health care have reduced access to needed contraceptives, which may result in more unintended pregnancies.

To mitigate the potential unmet family planning needs of this group, policymakers and health care providers should consider strategies tailored to women at risk of unintended pregnancy who are without a usual source of health care. This could include outreach and community education campaigns that advertise types of contraceptive methods available and where women can receive contraceptive services and supplies. Community clinics and other providers might also better serve at risk women without a usual source of care by initiating or increasing mobile health care services that include access to contraceptives.

A broader and more permanent strategy for policymakers and health providers to consider is to design and implement health care delivery models that link patients to a usual source of health care if they do not already have one. Linking to a usual source of health care may increase potential access to contraceptive services to many women at risk of unintended pregnancy. However, one challenge for policymakers, as well as the potential opportunity for additional research, would be deciding whether the patient or the system should drive the choosing of a usual source of care.

LIMITATIONS OF THIS RESEARCH

Before moving forward, it is important to note that the findings of this analysis, like any regression analysis, represent associations between variables and should not be misinterpreted as causal relationships. This analysis also has some limitations. Because I relied on secondary data, I was limited to the variables it contained. Had the variable existed in the 2006-2010 NSFG, I would also have explored the effect of having a regular doctor or clinician on contraceptive use. As in any analysis that uses survey data, there exists the possibility of measurement error due to "inaccurate responses associated with the respondent, the interviewer, the survey instrument, and the post-survey data processing" (Singleton & Straits, 2010, p. 281). Using computer-assisted personal interviewing, however, likely minimized the risk of inaccuracy by the interviewer. Measures were also put in place to check and mitigate survey instrument problems (CDC, 2011b). Some sampling error may also exist because the survey was administered to "clusters" of respondents rather than drawing a completely random sample (CDC, 2011b). Finally, I did not distinguish between types of usual source of health care, which may explain differences not measured in this analysis.

FUTURE RESEARCH

Many possibilities exist for future research that further explores the effect of usual source of care on contraceptive use. As mentioned, I did not distinguish between type of usual source of health care, nor did I distinguish between type of contraceptive method used by each woman in the sample. Future research should consider exploring the effect of having a usual source of care on the use of specific contraceptive methods, such as the

pill, IUD, and condom, as each method has different levels of efficacy. Similarly, exploring the relationship between type of usual source of health care (i.e. private doctor's office, community clinic, health maintenance organization, etc.) and contraceptive use may identify disparities needing attention. Measuring quality of care or specific health care delivery models and the effect on contraceptive use (specific method or use/non-use) may also be beneficial, as any differences may help policymakers and community health care leaders identify models of care that are more effective than others at providing access to contraceptives.

CLOSING REMARKS

Modern contraceptive methods are safe and effective at reducing the risk of pregnancy when used properly. Despite this, nearly 50 percent of pregnancies in the United States are unintended (Mosher & Jones, 2010). Unintended pregnancy is associated with both economic and social costs, thus, it is important for public health officials and policymakers to understand what factors predict contraceptive use. Understanding the factors associated with contraceptive use and nonuse can identify disparities and offer potential solutions to increase contraceptive access. The findings of this analysis suggest that having a usual source of health care is a predictor of contraceptive use among women at risk of unintended pregnancy, which may ultimately result in realized family planning needs and fewer unintended pregnancies. While limitations exist, they should not deter policymakers from considering strategies aimed at improving contraceptive access to women at risk of unintended pregnancy who are without a usual source of health care.

APPENDIX A: CORRELATION COEFFICIENT MATRIX

	Has Usual Source of Health Care	*15-17 years old*	*18-24 years old*	*25-29 years old*	*30-34 years old*	*35-39 years old*	*Hispanic*
Has Usual Source of Health Care	1.000						
15-17 years old	-0.003	1.000					
18-24 years old	-0.080***	-0.118***	1.000				
25-29 years old	-0.009	-0.108***	-0.290***	1.000			
30-34 years old	0.018	-0.100***	-0.268***	-0.245***	1.000		
35-39 years old	0.034**	-0.096***	-0.258***	-0.236***	-0.218***	1.000	
Hispanic	-0.086***	-0.013	-0.027*	0.001	0.041***	0.025*	1.000
Non-Hispanic Black	0.012	0.019	0.015	0.032**	-0.022	-0.019	-0.277***
Non-Hispanic Other	-0.025*	-0.005	-0.013	0.032**	-0.009	0.014	-0.125***
% Poverty level	0.129***	-0.060***	-0.096***	0.005	-0.010	0.043***	-0.162***
Working part-time	-0.017	-0.029	0.144***	-0.032**	-0.030**	-0.043***	-0.030**
Other working status	-0.001	0.117***	-0.013	-0.035**	-0.020	-0.001	-0.043***
Not working	-0.040***	-0.047***	0.065***	0.012	-0.034**	0.011	-0.014
In school	0.001	0.243***	0.135***	-0.026*	-0.075***	-0.097***	-0.044***
Keeping house	-0.040***	0.049***	-0.109***	-0.020	0.030**	0.061***	0.116***
≤12th grade no diploma	-0.110***	0.365***	-0.015	-0.064***	-0.016	-0.044***	0.205***
Some college-no degree	0.030**	-0.105***	0.138***	-0.003	-0.024	-0.022	-0.059***
Associate's degree	0.060***	-0.061***	-0.070***	-0.001	0.035**	0.027*	-0.015
Bachelor's degree or higher	0.056***	-0.112***	-0.158***	0.070***	0.026*	0.098***	-0.159***
MSA, Suburb	0.012	0.000	-0.044***	-0.029***	0.010	0.031**	0.052***
MSA, Non-Metropolitan	0.055***	0.029**	0.003	-0.025*	0.006	-0.019	-0.135***

	Has Usual Source of Health Care	*15-17 years old*	*18-24 years old*	*25-29 years old*	*30-34 years old*	*35-39 years old*	*Hispanic*
Private insurance	0.234***	-0.003	-0.084***	-0.020	-0.006	0.038***	-0.163***
Public insurance	0.033**	0.097***	0.063***	0.007	-0.006	-0.058***	0.011
Unmarried, but cohabitating	-0.086***	-0.081***	0.054***	0.059***	0.010	-0.061***	0.090***
Widowed, Divorced or Separated	0.010	-0.074***	-0.173***	-0.025*	0.063***	0.085***	-0.018
Never Married	-0.008	0.265***	0.375***	0.003	-0.131***	-0.206***	-0.114***
1 child in household	0.021	-0.042***	-0.007	0.019	-0.016	0.002	-0.002
2 children in household	0.037***	-0.115***	-0.149***	-0.001	0.056***	0.102***	0.061***
3 children in household	-0.012	-0.075***	-0.151***	0.009	0.130***	0.088***	0.118***
4 children in household	-0.016	-0.042***	-0.086***	0.023	0.105***	0.021	0.054***
≥ 5 children in household	0.005	-0.030**	-0.068***	-0.020	0.057***	0.058***	0.032**
Catholic	-0.037***	-0.021	-0.005	-0.028*	0.013	0.030**	0.428***
Protestant	0.076***	0.004	-0.019	0.008	-0.048***	0.004	-0.266***
Other Religion	-0.002	-0.015	-0.025*	0.014	0.018	0.021	-0.060***
0 opposite sex partners in past 12 months	0.002	-0.021	-0.049***	-0.058***	-0.003	0.046***	0.007
1 opposite sex partner in past 12 months	0.030**	-0.086***	-0.145***	0.012	0.055***	0.072***	0.096***
2 opposite sex partners in past 12 months	-0.013	0.054***	0.140***	0.025*	-0.051***	-0.076***	-0.076***

	Has Usual Source of Health Care	*15-17 years old*	*18-24 years old*	*25-29 years old*	*30-34 years old*	*35-39 years old*	*Hispanic*
1 opposite sex partner in lifetime	-0.002	0.099***	0.024	-0.017	-0.039***	0.001	0.183***
6-9 opposite sex partners in lifetime	0.010	-0.027*	-0.015	0.016	-0.002	-0.005	-0.113***
10-19 opposite sex partners in lifetime	0.016	-0.045***	-0.037***	0.010	0.053***	0.000	-0.138***
≥ 20 opposite sex partners in lifetime	-0.037***	-0.051***	-0.082***	0.021	0.063***	0.015	-0.116***

	Non-Hispanic Black	*Non-Hispanic Other*	*% Poverty level*	*Working part-time*	*Other working status*	*Not working*	*In school*
Non-Hispanic Black	1.000						
Non-Hispanic Other	-0.114***	1.000					
% Poverty level	-0.187***	0.035**	1.000				
Working part-time	-0.075***	-0.015	-0.036***	1.000			
Other working status	0.056***	-0.001	-0.021	-0.139***	1.000		
Not working	0.074***	-0.013	-0.106***	-0.139***	-0.082***	1.000	
In school	0.032**	0.026*	-0.070***	-0.133***	-0.078***	-0.078***	1.000
Keeping house	-0.031**	-0.002	-0.186***	-0.214***	-0.126***	-0.126***	-0.121***

	Non-Hispanic Black	*Non-Hispanic Other*	*% Poverty level*	*Working part-time*	*Other working status*	*Not working*	*In school*
≤12th grade no diploma	0.026*	-0.049***	-0.316***	-0.045***	0.079***	0.036***	0.082***
Some college-no degree	0.007	0.012	0.021	0.055***	-0.036***	-0.002	0.055***
Associate's degree	-0.013	0.001	0.072***	0.005	0.017	-0.003	-0.033**
Bachelor's degree or higher	-0.103***	0.074***	0.416***	-0.011	-0.025*	-0.063***	-0.076***
MSA, Suburb	-0.129***	-0.016	0.109***	0.006	-0.005	0.028*	-0.033**
MSA, Non-Metropolitan	-0.145***	0.030**	0.039***	0.024*	0.003	-0.050***	0.026*
Private insurance	-0.148***	0.015	0.504***	-0.031**	-0.030**	-0.159***	-0.020
Public insurance	0.203***	-0.034**	-0.368***	-0.025*	0.073***	0.113***	0.065***
Unmarried, but cohabitating	-0.044***	-0.007	-0.044***	-0.028*	-0.018	0.020	-0.044***
Widowed, Divorced or Separated	0.003	-0.028*	-0.084***	-0.042***	-0.008	0.042***	-0.047***
Never Married	0.226***	0.000	-0.126***	0.066***	0.050***	0.045***	0.180***
1 child in household	0.067***	-0.024	-0.013	-0.003	0.001	0.001	-0.044***
2 children in household	0.004	-0.025*	-0.078***	-0.028*	-0.027*	0.017	-0.085***
3 children in household	0.005	-0.007	-0.173***	-0.037***	-0.010	-0.010	-0.033**
4 children in household	0.035**	0.000	-0.133***	-0.010	0.003	-0.002	-0.031***
≥ 5 children in household	0.045***	-0.001	-0.109***	-0.009	0.010	0.022	-0.039***
Catholic	-0.235***	-0.015	-0.009	0.003	-0.050***	-0.056***	-0.022
Protestant	0.328***	-0.083***	-0.047***	-0.034**	0.032**	0.020	0.012
Other Religion	-0.080***	0.211***	0.018	0.018	-0.022	-0.003	0.010
0 opposite sex partners in past 12 months	0.007	-0.038***	-0.050***	-0.036***	-0.002	-0.007	0.029*
1 opposite sex partner in past 12 months	-0.095***	0.017	0.076***	-0.014	-0.013	-0.067***	-0.094***

	Non-Hispanic Black	*Non-Hispanic Other*	*% Poverty level*	*Working part-time*	*Other working status*	*Not working*	*In school*
2 opposite sex partners in past 12 months	0.096***	-0.009	-0.045***	0.028*	-0.005	0.059***	0.070***
1 opposite sex partner in lifetime	-0.136***	0.056***	0.005	0.030**	-0.011	-0.084***	0.060***
6-9 opposite sex partners in lifetime	0.055***	-0.032**	0.056	-0.032**	0.029*	0.019	-0.010
10-19 opposite sex partners in lifetime	0.054***	-0.001	0.004	-0.021	-0.020	0.066***	-0.024
≥ 20 opposite sex partners in lifetime	0.029**	-0.002	-0.011	0.004	0.019	0.030**	-0.028*

	Keeping house	*≤12th grade no diploma*	*Some college-no degree*	*Associate's degree*	*Bachelor's degree or higher*	*MSA, Suburb*	*MSA, Non-Metropolitan*
Keeping house	1.000						
≤12th grade no diploma	0.209***	1.000					
Some college-no degree	-0.084***	-0.287***	1.000				
Associate's degree	-0.069***	-0.163***	-0.149***	1.000			
Bachelor's degree or higher	-0.090***	-0.297***	-0.273***	-0.155***	1.000		
MSA, Suburb	-0.012	-0.060***	0.032**	0.019	0.004	1.000	
MSA, Non-Metropolitan	-0.015	0.000	-0.002	0.030**	-0.046***	-0.331***	1.000

	Keeping house	*≤12th grade no diploma*	*Some college-no degree*	*Associate's degree*	*Bachelor's degree or higher*	*MSA, Suburb*	*MSA, Non-Metropolitan*
Private insurance	-0.198***	-0.323***	0.051***	0.088***	0.320***	0.095***	0.028*
Public insurance	0.160	0.231	-0.055	-0.054	-0.218	-0.106	-0.005
Unmarried, but cohabitating	0.032**	0.054***	-0.009	-0.034**	-0.071***	-0.028*	-0.009
Widowed, Divorced or Separated	-0.033**	-0.007	0.004	0.013	-0.037***	-0.022	0.017
Never Married	-0.126***	0.084***	0.065***	-0.046***	-0.107***	-0.062***	-0.045***
1 child in household	-0.017	-0.008	0.004	0.023	-0.064***	-0.017	0.044***
2 children in household	0.082***	-0.001	-0.028*	0.040***	-0.009	0.026*	-0.014
3 children in household	0.124***	0.055***	-0.018	-0.021	-0.058***	0.009	-0.016
4 children in household	0.066***	0.054***	-0.003	-0.013	-0.053***	-0.006	-0.023
≥ 5 children in household	0.104***	0.054***	-0.023	0.008	-0.039***	-0.010	-0.023
Catholic	0.067***	0.104***	-0.038***	-0.037***	-0.002	0.074***	-0.088***
Protestant	-0.034**	-0.056***	0.039***	0.030**	-0.053***	-0.040***	0.072***
Other Religion	0.047***	-0.074***	-0.004	0.005	0.086***	0.042***	-0.042***
0 opposite sex partners in past 12 months	0.008	-0.007	0.004	0.023	-0.009	0.003	-0.026*
1 opposite sex partner in past 12 months	0.069***	-0.030**	-0.050***	0.036***	0.063***	0.045***	0.002
2 opposite sex partners in past 12 months	-0.074***	0.009	0.042***	-0.054***	-0.038***	-0.021	0.003
1 opposite sex partner in lifetime	0.085***	0.060***	-0.049***	-0.028*	0.038***	0.054***	-0.020

	Keeping house	*≤12th grade no diploma*	*Some college-no degree*	*Associate's degree*	*Bachelor's degree or higher*	*MSA, Suburb*	*MSA, Non-Metropolitan*
6-9 opposite sex partners in lifetime	-0.067***	-0.060***	0.027*	0.025	0.006	-0.037***	0.028*
10-19 opposite sex partners in lifetime	-0.017	-0.004	0.012	0.009	0.011	-0.045***	0.008
≥ 20 opposite sex partners in lifetime	-0.003	-0.009	0.033**	0.011	-0.012	-0.006	-0.018

	Private insurance	*Public insurance*	*Unmarried, but cohabitating*	*Widowed, Divorced or Separated*	*Never Married*	*1 child in household*	*2 children in household*
Private insurance	1.000						
Public insurance	-0.584***	1.000					
Unmarried, but cohabitating	-0.161***	0.060***	1.000				
Widowed, Divorced or Separated	-0.073***	0.036***	-0.151***	1.000			
Never Married	-0.051***	0.126***	-0.330***	-0.268***	1.000		
1 child in household	-0.059***	0.073***	0.029**	0.031**	-0.055***	1.000	
2 children in household	-0.040***	0.046***	-0.010	0.042***	-0.204***	-0.266***	1.000
3 children in household	-0.076***	0.039***	-0.017	0.058***	-0.150***	-0.175***	-0.196***
4 children in household	-0.064***	0.066***	0.008	0.024	-0.072***	-0.097***	-0.108***

	Private insurance	*Public insurance*	*Unmarried, but cohabitating*	*Widowed, Divorced or Separated*	*Never Married*	*1 child in household*	*2 children in household*
≥ 5 children in household	-0.051***	0.049***	0.017	-0.017	-0.050***	-0.069***	-0.077***
Catholic	-0.025*	-0.035**	0.048***	-0.048***	-0.081***	-0.063***	0.052***
Protestant	-0.001	0.048***	-0.071***	0.047***	0.047***	0.055***	0.010
Other Religion	0.020	-0.035**	-0.038***	-0.024	-0.053***	-0.006	-0.015
0 opposite sex partners in past 12 months	-0.005	0.010	-0.043***	0.175***	0.040***	-0.018	0.003
1 opposite sex partner in past 12 months	0.076***	-0.068***	0.120***	-0.190***	-0.327***	0.026*	0.095***
2 opposite sex partners in past 12 months	-0.059***	0.058***	-0.081***	0.094***	0.253***	0.001	-0.060***
1 opposite sex partner in lifetime	0.032**	-0.049***	-0.052***	-0.142***	-0.127***	-0.052***	0.016
6-9 opposite sex partners in lifetime	0.040***	0.002	0.016	0.069***	0.025*	0.001	-0.006
10-19 opposite sex partners in lifetime	-0.027*	0.038***	0.003	0.090***	0.033**	0.027*	-0.028*
≥ 20 opposite sex partners in lifetime	-0.068***	0.013	0.006	0.083***	0.040***	0.012	-0.026*

	3 children in household	*4 children in household*	*≥ 5 children in household*	*Catholic*	*Protestant*	*Other Religion*	*0 opposite sex partners in past 12 months*
3 children in household	1.000						
4 children in household	-0.071***	1.000					
≥ 5 children in household	-0.051***	-0.028*	1.000				
Catholic	0.061***	0.005	0.012	1.000			
Protestant	0.001	0.008	-0.004	-0.540***	1.000		
Other Religion	0.000	0.026*	0.020	-0.144***	-0.241***	1.000	
0 opposite sex partners in past 12 months	0.016	-0.019	-0.003	0.007	0.027*	-0.015	1.000
1 opposite sex partner in past 12 months	0.059***	0.025*	0.052***	0.099***	-0.059***	0.033**	-0.433***
2 opposite sex partners in past 12 months	-0.062***	-0.010	-0.039***	-0.074***	0.061***	-0.025*	-0.080***
1 opposite sex partner in lifetime	0.037***	-0.011	0.039***	0.140***	-0.079***	0.112***	0.005
6-9 opposite sex partners in lifetime	-0.015	-0.008	-0.023	-0.081***	0.041***	-0.051***	-0.038***
10-19 opposite sex partners in lifetime	-0.012	0.023	-0.029***	-0.108***	0.051***	-0.005	-0.030**
≥ 20 opposite sex partners in lifetime	-0.027*	0.001	-0.023	-0.095***	-0.002	0.010	-0.028*

	1 opposite sex partner in past 12 months	*2 opposite sex partners in past 12 months*	*1 opposite sex partner in lifetime*	*6-9 opposite sex partners in lifetime*	*10-19 opposite sex partners in lifetime*	*≥ 20 opposite sex partners in lifetime*
1 opposite sex partner in past 12 months	1.000					
2 opposite sex partners in past 12 months	-0.647***	1.000				
1 opposite sex partner in lifetime	0.201***	-0.172***	1.000			
6-9 opposite sex partners in lifetime	-0.061***	0.076***	-0.222***	1.000		
10-19 opposite sex partners in lifetime	-0.124***	0.092***	-0.188***	-0.170***	1.000	
≥ 20 opposite sex partners in lifetime	-0.195***	0.096***	-0.145***	-0.131***	-0.111***	1.000

* Correlation is Significant at .10%
**Correlation is Significant at .05%
***Correlation is Significant at .01%

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