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# Is Religious Affiliation a Predictor of Non-Contracepting Behavior among Women who have had an Abortion?

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Epidemiology

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Faculty Thesis Advisor

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By

Catherine Rault

B.S., Washington and Lee University, 2012

Faculty Thesis Advisor: Michael Kramer, PhD.

An abstract of

A thesis submitted to the Faculty of the
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# Abstract

Is Religious Affiliation a Predictor of Non-Contracepting Behavior among Women who have had an Abortion?

By Catherine Rault

Purpose: In the United States, 51% of all pregnancies are unintended and 40% of these pregnancies end in elective abortion. Of these abortions, 48% are repeat abortions. There has been an increase of research into the field of religion and sexual and reproductive health (SRH) behaviors, specifically focusing on contracepting behavior and unintended pregnancy. In previous literature, components of religion seem to have a mixed association with SRH, with some studies demonstrating an effect and others not. The purpose of this study is to determine the influence of religious affiliation on noncontracepting behavior among women of reproductive age who have had an abortion and are at risk for an unintended pregnancy.

Methods: We used 2011-2013 National Survey of Family Growth data to model the relationship between religious affiliation and noncontracepting behavior. We tested multivariable logistic models with religious affiliation as the primary exposure and recent noncontracepting behavior as the outcome, controlling for demographic variables.

Results: Among women 15-44 who have had an abortion, 56.1% are noncontraceptors. Proportions of noncontraceptors were 67.4% (SE 7.8) among Catholics, 62.3 % (SE 8.3) among Fundamentalist Protestants, and 46.0 (SE 6.4) among Mainstream Protestants. In multivariable modeling, religious affiliation was not associated to noncontracepting behavior.

Conclusion: Among women who have had an abortion, religious affiliation is not associated with their noncontracepting behavior.

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# BACKGROUND / LITERATURE REVIEW

## *Introduction – Identifying the Problem*

In an effort to reduce repeat abortions in women, researchers and public health officials need to identify and understand risk factors for a subsequent abortion in women who have had an abortion (1, 2). Risk factors for subsequent abortion include any factor that prevents a woman from effective contracepting behavior (2). Contracepting behavior is a woman's use of any highly effective contraceptive method (3) and is the best way to prevent unintended pregnancies and repeat abortion (4). By identifying barriers to highly effective contracepting behavior in women who have had an abortion, public health officials may be able to create an intervention to specifically target these barriers by addressing them during contraceptive counseling, at the time of an abortion, or through other means (2). One potential predictor of repeat abortion, which has not been examined in this population, is religious affiliation. The research into the complex field of religion and sexual and reproductive health has grown rapidly, with studies demonstrating that religious affiliation is related to women's sexual and reproductive health choices (5). This study contributes to this literature and investigates the influence of religious affiliation on non-contracepting behavior among women who have had an abortion.

## *Incidence of Unintended Pregnancy*

Unintended pregnancy is a public health concern as women and children experience worse outcomes when a pregnancy is unintended (6). Whether these pregnancies are terminated or carried to term, there are mental, psychological and physical pressures on the woman who bears this unintended pregnancy (7). Despite these adverse outcomes, Finer (2014) found that

51% of the 6.6 million pregnancies that occurred in the US in 2008 were unintended, leading to roughly 3.3 million unintended pregnancies annually (2, 6, 8-10).

As a result, unintended pregnancies pose national health and economic concerns that national public policies seek to address (11). For instance, to address the health of women and children, the U.S. Department of Health and Human Services Healthy People 2020 initiative set a primary goal to decrease the overall percentage of unintended pregnancies (12). This initiative addresses both the public health and the economy, as unintended pregnancies are estimated to cost 11 billion dollars of taxpayer money annually, with a majority of these costs incurred though Medicaid (13). Yet while unintended pregnancy has implications on a national level, on an individual level, decreasing unintended pregnancy enables women to have greater control over their sexual and reproductive lives and better plan whether or when to have a child (11).

*Incidence of Elective Abortion*

As long as unintended pregnancy remains prevalent in the US, women will require access to abortion services, with some needing access more than once (14). There are two types of abortion: spontaneous, which denotes miscarriages, and elective abortion. When a woman opts for an elective abortion, she will either have a medical or surgical abortion; this decision depends on how far along her pregnancy is, her provider and her intentions.

Finer (2014) found that 40% of all unintended pregnancies ended in elective abortion in 2008 (10). In 2011, Jones (2014) reported this to be equal to 1.1 million abortions in the US annually (10, 15). Of these 1.1 million abortions, 48% are repeat procedures, where the woman has had at least one previous abortion (2, 14). This results in approximately 0.65 million repeat abortions each year (2). Repeat abortion has been correlated with increased risk for future adverse pregnancy outcomes, specifically low birth weight and preterm delivery (16). This data indicates

that women who have an abortion are more likely to have a future abortion compared to women who have never had an abortion, but further research needs to focus on *why* this particular population is at greater risk (14).

It is important for public health professionals and abortion providers to recognize repeat abortions as a common occurrence (1). For example, Creinin (1999) examined a cohort of women for a year following a medical abortion. During this year period, 24.7% of the women had another unintended pregnancy (17). Of these women, all opted to have an elective abortion, except one who had a spontaneous abortion and another who had a normal term delivery, (17). In addition, Upadhyay et al. (2012) examined women who wanted to avoid pregnancy for at least one year and compared women who had histories of abortion with those who had never had an abortion(18). His study showed that women who had a recent or previous abortion were 60% more likely to have a pregnancy in the one year follow up period than women who never had an abortion (18). Not only are women who have an abortion at high risk of repeat unintended pregnancies in the subsequent year, (17) but they are at a higher risk to have an unintended pregnancy than women who have not had an abortion (18).

Thus, in order to reduce repeat abortions, public health officials must focus on reducing repeat unintended pregnancy by preventing unintended pregnancy in this population in general (11). After Jones et al. (2006) determined that roughly 0.65 million abortions – half of all abortions – were repeat abortions, an influx of researchers have started to investigate why this population is at such great risk for subsequent unintended pregnancies and elective abortions (4). Specifically, Jones et al. (2006) suggested that future research examine the various factors, such as social and demographic factors, that contribute to and result in a repeat abortion. Establishing the risk factors for repeat abortion will provide a realistic indication of the reduction in repeat abortion that can be achieved through improvements in contraceptive services (14).

*Risk factors for repeat abortion*

Prior research has focused on identifying key characteristics of women who have a primary abortion as opposed to a repeat abortion. Those women who are more likely to have had a previous abortion differ from those women having their first abortion. For instance, women who are have a repeat abortion are more than twice as likely to be age 30 or older (2, 11), twice as likely to have a child, after controlling for age, (11) twice as likely to have a history of physical abuse (19), 1.5 times as likely to have a history of sexual abuse or violence (19), 1.5 times as likely to have a history of sexually transmitted disease (19) and 2.5 times the odds of having alcohol or drug abuse problems (2).

Women who have had an abortion, regardless of whether it is her first or second or greater abortion, share similar characteristics with women at risk of having repeat unintended birth, such as age, number of prior pregnancies, race and ethnicity and poverty (11), regardless of the fact that women who have had an abortion opted for an abortion while women who have had a prior birth opted to birth the child.

*Contraceptive Use*

Jones et al. (2002) determined that this high level of unintended pregnancy is due to three major factors among couples at risk of unintended pregnancy (20). These factors are: 1) failure to use contraception, 2) incorrect or inconsistent use of contraception, and 3) method failure, despite correct and consistent contraception use (20). For all women of reproductive age (15-44 years old), 62% of women are contracepting. For all reproductive age women at risk of unintended pregnancy—that is, they are sexually active and do not intend to become pregnant -- 89% are contracepting (21, 22). Among those women who are having an abortion, whether their first, second, third or more, 54% claimed they had used some form of contraception at the time of

conception (11, 14). This data illustrates two points; first, women are not using repeat abortion as their first method of contraception, as those who had prior abortions do not have lower levels of contraceptive use at the time of pregnancy (11, 14). Second, the remaining 46% of women having abortions had non-contracepting behavior (8, 11, 14), which is greater than the non-contracepting behavior in all women aged 15 to 44, which is 38%. Yet, this 38% of non-contracepting reproductive age women are not all at risk of unintended pregnancy as: 9% are pregnant or postpartum and 19% are not currently sexually active (21). Only 10% of reproductive age women are at risk of unintended pregnancy (22). Many studies have validated the percentage of non-contracepting sexually active women in subgroups of the population between 10% and 15.8% (23-25). Researchers need to determine why women who have had an abortion are more likely to engage in non-contracepting behavior, and as a result of this have more unintended pregnancies and more abortions. This small portion of non-contracepting women make up half of the abortions (11); clearly indicating the protective effect, effectiveness and importance of contraception.

Providing post-abortion contraception is becoming increasingly prevalent during a women's abortion visit (4). This is because the woman is already in the office, the provider is available, and the woman is at high risk for future unintended pregnancy (4). According to one study, if 20% of women in the US who receive an abortion choose to have an immediate post-abortion intrauterine device (IUD) insertion, 43,000 unintended pregnancies could be prevented annually (26). If women do not begin immediate contraceptive use post-abortion, they remain at high risk of unintended pregnancy; not only is their fertility unaffected within a year post-abortion (17), but there risk status derived from their non-contracepting behavior has not changed post the abortion (27).

In order to understand women's choices surrounding contracepting behavior, it is important to understand a woman's attitude toward both motherhood and contraception (20).

Contracepting behavior is critical in order to prevent unintended pregnancies and repeat abortion; therefore, it is important for researchers to understand why individuals are opting out of contracepting. Reasons for non-contracepting behavior fell into five major categories: contraceptive method related factors, demographic and socioeconomic characteristics, sexual partnership factors, contraceptive counseling, and factors related to healthcare (23).

Among reproductive age women, common contraceptive method related reasons for non-contracepting behavior are a perceived low risk of pregnancy, problems with methods, unplanned and unexpected sex, contraceptive ambivalence, problems accessing contraception, reluctance of their partner to use certain methods of contraception (14), and being dissatisfied with one's contraceptive method (24). Common social and demographic reasons for non-contracepting behavior in women are being black, older (either 35-44 or 40-44) (23, 24), born outside the US, annual household income between 100-249% federal poverty line (FPL), raised in Catholic religion, unmarried and not cohabitating (23), and having less than a college education. Common sexual partnership factors for non-contracepting behavior include having infrequent sexual intercourse and not being in a current relationship (24).

Many studies investigate contraceptive method related factors, which are crucial to understand non-contracepting behavior. However, these factors— problems with methods and difficulty accessing methods etc.—are generally problems that women face after she decides to use a contraceptive method. In contrast, demographic factors – socioeconomic status --hinder women's decision to use or access a contraceptive method at all. Therefore, it is important to identify any and all factors that are predictors of non-contracepting behavior in women, specifically in women who had an abortion as they have increased risk for unintended pregnancy and repeat abortion. Many social and demographic factors have been assessed; however, there is a lack of literature investigating the role of religious affiliation on non-contracepting behavior in women who have had an abortion.

*Religion*

*1. Why we should study religion as an exposure?*

There are many theories regarding the effect of religion on sexual and reproductive health behavior (28, 29), one of which is social control (30). Social control theory, originally applied to criminology, focuses on the factors that restrain people from certain types of behavior (31). For instance, as applied to criminology, the theory addresses why humans have an internal drive for deviance, or crime, yet not all individuals commit crime. Social control theory thus studies the restraints that keep people from delinquent behavior to which they are inclined (30, 31). One of these restraints could be bonds that one feels towards social organizations, such as religion (30, 31).

There are three types of social control that explain religion as a restraint to deviant behavior: direct control, stake in conformity, and internal control (31). Direct control is when people watch over others and sanction them for misbehavior. Often people think of this as the role that parents have over their children, but it can also be applied to the role of religious leaders over members of the church (31). Direct control is increased when an individual is provided with clearly defined rules that prohibit or dictate certain behaviors, and provide sanctions against these types of behaviors (31). Some individuals are more responsive to these controls than others because they feel that the consequences of breaking the rules are higher (31). These individuals have a high "stake in conformity" and may fear losing their affiliation with the group. An individual stake in conformity depends on both the individual's emotional attachment to the group, their investment in the society, and the value they attribute to their religion (31). Finally, internal control refers to an individual's own beliefs towards certain behaviors and their level of self-control (31). If an individual agrees with their church's teaching regarding contraception, for example, she will have a higher level of self-control when presented with the opportunity to

engage in contraceptive use (31). When these three factors are combined—direct control, stake in conformity, and internal control—they can act as restraints for an individual to engage in certain behaviors. In the context of religion and contraception, these three factors may act to restrain religious members from engaging in contracepting behavior in order to avoid breaking the rules of their religious doctrine.

Not only do religious institutions outline their beliefs, but there are also consequences for individuals who engage in behaviors that are considered outside the bounds of their religion. These consequences include feelings of guilt, shame, psychological distress, public embarrassment, and threat of expectation of divine punishment (32). Knowledge and fear of these consequences pressures religious individuals to behave according to the beliefs outlined by their religion, which in turn influences their sexual and reproductive behavior and views on contraceptive use (29). Yet, we know that some individuals still behave in discord with their religious doctrines. This behavior, if the individual is truly a part of their social organization, leads to cognitive dissonance, the psychological state in which there is a contradiction between an individual's action and her beliefs (33). Therefore, if a woman is affiliated with a religion that prohibits abortion, yet still decides to have an abortion, she may experience cognitive dissonance. In order for an individual to decrease the psychological strain of cognitive dissonance, they can either change their behaviors or change their beliefs so that they are no longer in opposition (33). For example, if a woman is having premarital sex, she could either stop having premarital sex, or alter her beliefs to disassociate from those of her religious doctrine, or completely disconnect from her religion in order to decrease the tension she may feel between her beliefs and her behavior (33).

Social control theory and cognitive dissonance demonstrate the value of studying religious affiliation when examining contraceptive use among a population of women who have had an abortion. Women who have had an abortion are an important sub group to examine, as

depending on their religious affiliation, these women may have engaged in behaviors that go against their religious doctrine. Based on the theoretical construct of cognitive dissonance, women who have had an abortion are debating which avenue is right for them: cut ties with their religious affiliation or stop engaging in behavior that is considered wrong. In order to ensure that they avoid future abortions, some women may decide to seek out highly effective contraception to avoid the risk for future abortions. Yet, other women may decide not to engage in contracepting behavior because contraceptive use is also against their religious doctrine; therefore, they do not want to increase their cognitive dissonance by continuing 'delinquent' behavior. Many of these women will not be able to rationalize their behaviors with their religious doctrine and begin to turn away from their affiliations. Yet, outside the theory of cognitive dissonance, it has been shown that many women are comfortable with dissonance between institutional norms and personal sexual and reproductive behaviors (34). If this is the case, then a women's religion affiliation and doctrine may not matter or have an influence on her sexual and reproductive decisions. This is an important population to study as religious affiliation under social control theory and cognitive dissonance show that these women face increased barriers while deciding how best to avoid unintended pregnancies and the need for future abortion.

*2. How is religion defined in research?*

Religion and religiosity is a complex social factor and includes many different components, such as current religious affiliation, childhood religious affiliation, attendance in worship services, participation in religious youth groups, and value attributed to religion in daily life (3, 34-38). Many studies examine a component of religion and its influence on sexual and reproductive health decisions. Therefore, studies on religion are often limited, as each measure seems to account for a different aspect of religion and may have more meaning to different

individuals. Finding a more concise and precise measure of religion and its role in an individual's life is needed in order to have a clearer and more thorough understanding of the effect of religion on sexual and reproductive health outcomes (29). Yet, even with these limitations, research has found that religion is a major contributing factor to a women's health decisions, including their sexual and reproductive health (36).

*Religion and Sexual and Reproductive Health*

Religion plays a crucial role in the life and health of women in the United States (5). With regards to reproductive health, sex is not only a normal developmental process but also a moral issue entrenched in religious values (5, 36). This dichotomy creates a tension between religion on the one hand and reproductive health and family planning on the other (5). At the community level, religious institutions have the potential to influence public norms in both the spoken and unspoken values shared among the religious community (5). However, the extent to which a woman incorporates her religious doctrine into her sexual and reproductive health decisions is an individual and personal choice (39).

Religious women do have sexual relationships, and research has shown that characteristics of religion— religious affiliation, value attributed to religion in daily life, attendance at worship services, to name a few— influence their views on relationships, marriage, childbearing, sexual intercourse, contraception, pregnancy and abortion (3, 29, 34-38, 40, 41). Among teenagers, 90% report having a religious affiliation, though fewer report regularly attending religious services (36). Girls are more likely to participate in religious services and attribute more value to religion in their lives than boys (36). Black teens are more likely to attribute greater value to religion in their lives than white teens (36). Teens who attend religious

services are more like to have later sexual initiation and less permissive attitudes towards sex (34, 36, 38, 40). One study found that "religion decreases the level of sexual activity (37)."

Yet, further research claims that religious affiliation and frequency of religious services attendance does not have significant impact on sexual behavior after a woman has already had sexual intercourse (34). This would indicate that despite potentially experiencing cognitive dissonance after their first sexual intercourse, women decided to continue to engage in sexual behavior while dissociating, whether by a small degree or entirely, from their religious affiliation.

*Religious Affiliation and Contraception*

Among reproductive age women in the United States, 83% have a religious affiliation, 33% attended religious services at least once a month, and 57% indicate that religion is very important in their daily lives (42). Among the same group, 15.5% of Catholics, 10.3% of Mainstream Protestants and 15.0% of Fundamentalist Protestant had non-contracepting behavior (3). This does not greatly differ from the 11% of all reproductive aged women at risk for unintended pregnancy who are non-contracepting (42).

Strong religious beliefs, frequent attendance at religious services, and affiliation with certain denominations are associated with decreased use of sexual and reproductive services and contracepting behavior in young women (35, 36). These women are at risk for negative sexual and reproductive health outcomes (36, 43). Catholic teens were fifteen times as likely, and Fundamentalist Protestant teens five times as likely, to exhibit non-contracepting behavior compared to Mainstream Protestants teens (3).

Despite these findings, other research has found that women from communities with high levels of religious affiliation had an increase in contracepting behavior (41). In addition, although

Catholicism does not condone the use of any contraceptives, Catholics are more likely to use certain methods of contraception (pill, ring, IUD) than Protestants (37). These chosen methods are preferred because they allow individual more control in their sexual and reproductive health, while also being easy to conceal the decision to use contraception (37). The researchers from these studies argued that these findings suggest that fear of guilt, shame and condemnation in religious communities discouraged unintended pregnancies and thus promoted effective contraceptive practices (37, 41).

Research on religion and contracepting behavior is a complex and muddled field with researchers often reaching opposing conclusions. Future research examining religion and reproductive decisions is necessary to build a better understanding of this field (5). To further investigate this relationship, this paper will focus on a sub population of reproductive age women through the lens of religious affiliation, or lack thereof. Since women who have had an abortion are at great risk for subsequent unintended pregnancy, women in this population who are influenced by religious affiliation, and thus who are also experiencing a new form of cognitive dissonance between their behaviors and religious beliefs, are an excellent sub population to focus on. By examining the extent to which religious affiliation influences non-contracepting behavior in women who have had an abortion, healthcare professionals will be able to use this knowledge when counseling women during contraceptive counseling by appropriately addressing concerns arising from their religious affiliation (20).

*Gaps in Knowledge*

Unintended pregnancy is a recognized public health issue in the United States. Half of all unintended pregnancies end in abortion. Women who have had an abortion are at greater risk for both unintended pregnancy and repeat abortion. Identifying the factors that increase this

population's risk for unintended pregnancy and repeat abortion will allow for the development of targeted interventions, which will reduce both the frequency of unintended pregnancy and the resulting need for abortion (2).

Contracepting behavior is the most effective way to decrease unintended pregnancy. In order to reduce the need for repeat abortion, research should focus on factors that are associated with effective contracepting behavior. Research has shown that social demographic variables, such as age and race, influence contracepting behavior. Religion in particular has been shown to affect women's sexual and reproductive health choices and behaviors. Specifically, religious affiliation is an important risk factor to study among women who have had an abortion, as views on sexual and reproductive practices, such as contracepting behavior, vary among doctrines. This research investigates if religious affiliation influences non-contracepting behavior in women who have had an abortion.

# METHODS

We used data from the 2011-2013 National Survey of Family Growth (NSFG), which is the most recent in the series periodically conducted by the National Center for Health Statistics (NCHS). The NSFG data are based on a multi-stage probability based, nationally representative sample of the household population aged 15-44 (44). It was a nationally representative, cross-sectional sample of 5, 601 women aged 15-44 years interviewed from September 2011 to September 2013. NSFG provides information on religious affiliation, contraceptive behavior and abortion history. The response rate for the female respondents was 73.4%. Respondents approximate the reproductive experiences of 61 million civilian, non-institutionalized, US women.

*Inclusions / Exclusions*

Our analysis includes only women i) who have ever had an abortion, ii) who self-identify as Catholic, Fundamentalist Protestant, Mainline Protestant or having No Religious Affiliation, and iii) who are at risk for unintended pregnancy. By this last classification, we mean women who are neither pregnant, intending to become pregnant, postpartum, sterile (for contracepting or other reasons), never had intercourse since first period, nor identified male sterilization as their primary method of contraception.

*Definition of Exposure*

The NSFG classified religious affiliation into two variables: 'Religion Now' and 'Religion Now with Protestant Denomination.' Based on the findings of Kramer (2007) and Jones (2005) on the most meaningful categories of religious affiliation -- by taking into account historical and politically meaningful categories and taking into account sample size-- we collapsed the detailed groups into fewer, larger categories: (i) No Religious Affiliation, (ii)

Catholic, (iii) Fundamentalist Protestant (labeled as Evangelical Protestant in NSFG), and (iv) Mainline Protestant (34). These four categories were outlined well in the variable 'Religion Now with Protestant denomination.' In addition to the categories, there were also 'Black Protestant,' 'Other Religion', 'Refused,' and 'Don't Know'.

We excluded 'Other Religion', 'Refused,' and 'Don't Know.' Kramer (2007) and Jones (2005) included a category 'Other Religion' which encompassed all other religions in the NSFG: Hinduism, Islam, Judaism, Mormonism, nondenominational Christianity and women who indicated they were not raised to identify with "any particular faith (3, 34)." However, in this study, we opted to exclude these affiliations as any affect determined in this group would not be meaningfully significant.

For "Black Protestants," we ran a cross tab between 'Religion Now' and 'Religion Now with Protestant Denomination' in order to see the distribution of 'Black Protestants' across all current religions. Thirty-seven of the 'Black Protestants' identified as Fundamentalist Protestant, and were thus labeled as 'Fundamentalist Protestant' in our study. The rest were identified as Mainline Protestants and were thus labeled as 'Mainline Protestants' in our study.

*Definition of Outcome*

The outcome of interest is noncontracepting behavior among women who have ever had an abortion and are currently at risk for unintended pregnancy, which means the women are sexually active within the past 3 months and do not intend to become pregnant at the time of the interview. Based on prior research, non-contracepting behavior was examined by grouping the 21 different forms of contraception into behaviors considered highly effective methods and not (37). Highly effective methods were those that were non-adhoc, while others were considered adhoc (37). The highly effective methods include: pill, injectable, implants, IUD, patch, and ring. The non-highly effective methods includes: no contraception, withdrawal, periodic abstinence:

calendar rhythm, periodic abstinence: temperature rhythm, diaphragm, male condom, female condom, foam, sponge, suppository, jelly or cream (not with diaphragm), morning after pill (emergency contraception) and other method, other nonuser – has had intercourse but not in the 3 months prior to interview, other nonuser – had intercourse in the 3 months prior to interview.

As we are examining current contracepting behaviors to prevent unintended pregnancy, both female and male sterility identified as the primary method of contraception were excluded as an individual may have had a sterilization procedure years before and perhaps not in regards to preventing unintended pregnancy. Women who are pregnant, seeking pregnancy, postpartum or have never had intercourse since first period were also excluded, as they were not at risk for unintended pregnancy.

*Definition of Covariates*

Based on previous research and logic, twelve covariates were examined as potential confounders of the association between religious affiliation and noncontracepting behavior: number of previous abortions (11, 45), age (2, 3, 6, 9, 11, 12, 14, 34, 37, 45), parity (11, 14, 29, 35, 45), race/ethnicity (1, 2, 9, 11, 14, 34, 35, 37), education (highest completed year of school or highest degree received) (2, 16, 24, 34, 35, 37), union status (2, 4, 6, 9, 11, 34, 35), poverty level (6, 11, 14, 16, 32, 34, 35), income (2, 3, 6, 9, 35, 37), current health insurance status (2, 6, 35, 37), number of male sexual partners in the last 3 months (19, 35, 44), number of male sexual partners in lifetime (11, 34, 35), received pap smear or pelvic exam in the last 12 months (35), and born out of the US (2, 9, 35).

All of the covariates were examined as categorical variables. NSFG recodes many of its variables in order to have clean and unidentifiable data available for public use. Categories based off NSFG recoded variables were mostly used, with the exception of grouping extreme outliers to account for sparse data. Some variables categorizations were based on previous literature, such as the age variable. Number of previous abortions was categorized as either one abortion or more

than one previous abortion. Age was categorized in 5 groups: <20, 20-24, 25-29, 30-34, 35 and greater. Parity was categorized into 4 groups: 0, 1, 2, 3+ births. Race/ethnicity was categorized into 4 groups: White non-Hispanic, Black non-Hispanic, Other non-Hispanic, Hispanic. Education was categorized into 4 groups: Less than High School, High School Degree, Some college / associates, College Degree or More. Union Status was defined into 4 categories: Married, Cohabitating, Separated/Divorced/Widowed, Never Married. Poverty was defined into 3 categories, poverty level between 0-100% federal poverty line (FPL), 100-199% FPL, greater than 200% FPL. Current health insurance status was categorized into three categories: Private, Public (including Medicaid) and None. Number of male sexual partners in the last 3 months was categorized into 3 groups: 0, 1 or 2+ partners. Number of male sexual partners over lifetime was defined into 5 categories: 1, 2-3, 4-5, 6-9, 10+ partners. Received Pap smear and/or pelvic exam in previous 12 months prior to interview was dichotomized as yes or no. Born outside the US was dichotomized as yes or no.

*Analysis*

All analyses were carried out accounting for aspects of the complex sample design using SAS survey procedure. Frequency tabulations of weighted sample proportions of covariates by exposure (religious affiliation) and noncontracepting behavior (outcome) were estimated and compared using chi-square tests for independence.

In order to examine the influence religious affiliation has on noncontracepting behavior in women age 15-44 who have had an abortion and at risk for unintended pregnancies, multivariable logistic regression models were constructed considered the following categorical covariates: number of previous abortions, age, parity, race/ethnicity, highest completed year of school or highest degree received, union status, poverty level income, current health insurance status, number of male sexual partners in the last 3 months, number of male sexual partners in

lifetime, received pap smear or pelvic exam in the last 12 months and born out of the US. Based on prior literature, we considered three two-way interactions between religious affiliation and either age (3, 37), race/ethnicity (37) or poverty (as an indicator as SES) were examined. We used backward elimination and examined stratum specific effects to identify evidence of meaningful interaction. Confounding was examined using the 10% rule in order to determine the best models to examine this association. All analysis was completed with SAS 9.4, allowing for complex weighted sample design.

# RESULTS

*Sample Description*

Of 5,601 women ages 15- 44 year participating in the 2011-2013 NSFG survey, 699 women had ever had an abortion. Of this women, 660 associated with a denomination other than 'Other.' Of this group, 428 women were considered at risk for unintended pregnancy, as they were not pregnant, not seeking pregnancy, not postpartum, not sterile, not using male sterility as their primary method of contraception and have had sex since her first menses.

## Bivariate Analysis

*Religious Affiliation and Noncontracepting Behavior*

The majority of our population had noncontracepting behavior (56.3%, SE 4.4). Among most religious affiliations, the majority had noncontracepting behavior, with Catholics having the highest at 67.4% (SE 7.8); Mainline Protestants was the only affiliation with less women being noncontraceptors (46.0%, SE 6.4) ($\chi 2$ p-value = 0.007).

*Religious Affiliation and Covariates*

The majority of the women in our study (79.1%) identified with a religious affiliation. The four levels of the exposure variable (No Religious Affiliation, Catholic, Fundamentalist Protestant and Mainline Protestant) are similarly distributed across most of the covariates: number of previous abortions, age, parity, education, union status, poverty level, number of male sexual partners in the past 3 months, number of male sexual partners over lifetime, and born outside the US ($p > 0.05$) (Table 1). Religious affiliation is not equally distributed across race/ethnicity, insurance coverage nor received Pap smear / pelvic exam in past 12 months. Among Fundamentalist Protestants and No Religious Affiliation, the largest represented race/ethnicity is Black non-Hispanic (71.6%, SE 6.9 and 56.1%, SE 6.9 respectively). However, Black non-Hispanic is 38.1% (SE 7.7) among Mainline Protestants and Black non-Hispanic are

43.1% (SE 8.2) among Catholics ($\chi 2$ p-value < 0.0001). Across insurance coverage, 65.4% (SE 5.9) of Catholics have private health insurance, while 59.0 % (SE 6.2) of Mainline Protestants and 34.9% (SE 8.6) of Fundamentalist Protestants, and 33.4% (SE 6.1) of No Religious Affiliation have private health insurance ($\chi 2$ p-value < 0.0001). Recent receipt of a Pap smear and/or pelvic exam in the past 12 months varied by religious affiliation with 68.1% (SE 4.8) among Mainline Protestants and only 44.1% (SE 6.0) among No Religious Affiliation did ($\chi 2$ p-value = 0.005).

*Noncontracepting Behavior and Covariates*

Among all women 15-44 who have had an abortion and are at risk of unintended pregnancy, 56.3% (SE 4.4) are currently noncontracepting. The prevalence of noncontracepting is similar across the majority of covariates: number of previous abortions, age, race/ethnicity, union status, poverty level, number of male sexual partners in the past 3 months, number of male sexual partners over lifetime and born outside the US ($p > 0.05$) (Table 2). Noncontraceptors are more likely than contraceptors to have had no previous births (59.8%, SE 5.8), one previous birth (67.8%, SE 5.0) and three or more previous births 61.4%, SE 11.3) ($\chi 2$ p-value = 0.02). Noncontraceptors are more likely than contraceptors to have less than a high school education (58.6%, SE 9.1), a high school degree (69.8%, SE 4.9), or college degree or higher (52.8%, SE 9.4) and were less likely to have some college / associates (47.5%, SE 6.2) ($\chi 2$ p-value = 0.03). Noncontraceptors are more likely to have not received a Pap smear / pelvic exam in past 12 months (72%, SE 4.4), and were less likely (44.6%, SE 5.2) to have received these reproductive services ($\chi 2$ p-value < 0.0001).

**Regression Models**

After assessment of interaction, there were two significant interactions (religious affiliation * race/ethnicity and religious affiliation * age), but upon observation there was not meaningful heterogeneity. This may be a function of influence of outlier observations of sparse data cells. Three models were assessed: Model 1 fit the OR for noncontracepting behavior by current religious affiliation, adjusted for all covariates; Model 2 fit a reduced set of the covariates; and Model 3 was the crude model only fitting the OR for noncontracepting behavior by current religious affiliation (Table 3).

Among women who have had an abortion and are at risk for unintended pregnancy, religious affiliation was not associated with noncontracepting behavior across all models. As the models control for more covariates, the association between religious affiliation and noncontracepting behavior increases. Thus the confounders confound the relationship toward the null. Yet, since there is sparse data, the confidence intervals are extremely wide and no relationship can be established in any model.

Though these associations of effect are not significant, Model 2 is our best model as it controls for all covariates which demonstrated any significant change in the association estimates, while dropping the variables which showed no confounding in the religious affiliation and non contracepting behavior association. Catholics have a highest odds of noncontracepting (OR = 2.77; 95% CI, 0.83 – 9.29) compared to No religious affiliation, followed by Fundamentalist protestants odds of noncontracepting (OR = 1.2; 95% CI, 0.48 – 3.00) compared to No religious affiliation. In comparison, Mainline Protestants have a lower odds of noncontracepting (OR = 0.90; 95% CI, 0.41 – 1.98).

# DISCUSSION

Our findings indicate that religious affiliation is not significantly associated with noncontracepting behavior in women age 15-44 who have had an abortion and are at risk of unintended pregnancy. The extent to which a women incorporates her religious doctrine into her sexual and reproductive health decisions is a personal and individual decision (39). Previous research in the field of religion and contraceptive use has varied, with some studies showing religious teens to have a greater odds of noncontracepting behavior (3), while other studies have found that women with high levels of religious affiliation had increased contracepting behavior (41). Yet, this previous research focused on women 15-44 at risk of unintended pregnancy, with no specification of having had an abortion. This study took this research question a step further to examine this subgroup of women, as half of all abortions each year occur in women who have previously had an abortion.

Although this study found null results, it did demonstrate that among women 15-44 who have had an abortion and at risk of unintended pregnancy there is a large proportion (56.3%, SE 4.4) with noncontracepting behavior. This number may seem much greater than other studies, which indicate noncontraceptive behavior between 10-15% across Catholics, Mainstream Protestants, Fundamentalist Protestants and all reproductive age women (3, 42). This is due to the categorization of noncontraceptive behavior; other studies consider non-contracepting behavior to be no method of contraception; while we defined noncontracepting behavior to be adhoc methods. Regardless of this, the majority of women in this study are in need of non-adhoc highly effective contraceptive methods. Contraception is the most effective way to decrease unintended pregnancies, and in a population at higher risk for unintended pregnancies, it is crucial for avoiding future unintended pregnancies and abortions. Future research should examine risk factors for noncontraceptive behavior in this population.

With the Affordable Care Act increasing healthcare coverage to million across the US with all plans, including Medicaid, having contraceptive coverage, there is now widespread availability of free and effective contraceptive methods. This increase in coverage will hopefully allow all women, regardless of income and poverty level, to access effective contraception. In addition, the trend toward patient centered care in abortion service delivery and providing contraceptive counseling and service at the time of abortion have been well received (4, 27, 46). If women are offered contraception at this time, the women in our population, would have higher rates of contraceptive behavior.

**Study Limitations**

In the 2011-2013 NSFG survey, only 38% of abortions were reported to NSFG. NSFG determined this by comparing NSFG weighted estimated of abortions with external data from abortion providers over the course of the same time period. This great underreporting of abortion significantly limits our study as we only examined women who reported to NSFG that they have had an abortion. Therefore, our findings based on this NSFG data are considered exploratory. There may be bias, as we do not know if there was a difference between the women who reported and the women who decided to not report.

Due to this small sample size from the abortion data, we were also limited in our analysis. Yet, as religion and sexual and reproductive health is an emerging field where research is needed, we accepted this limitation in order to examine if religious affiliation influences noncontracepting behavior. We were not properly able to examine the interaction term between age and religious affiliation due to sparse outlier data. In addition, this limitation led to large confidence intervals and a less of an effect.

**Future Directions**

As religious affiliation does not, in these data, influence noncontracepting behavior, it is not necessary for clinicians, abortion providers nor contraceptive counselors to address religion during contraceptive counseling. It is always important to be culturally sensitive; yet as religious affiliation does not appear to be a risk factor, it does not necessarily need to be addressed in discussing barriers to effective contracepting behavior.

Future research should continue to examine this population of women age 15-44 who have had an abortion and are at risk of unintended pregnancy. As the majority of these women have noncontracepting behavior, there are clearly barriers to effective contracepting behavior. Future research should investigate potential risk factors. From this study, we would suggest examining number of male sexual partners in past 3 months, number of male sexual partners over lifetime and received Pap smear and/or pelvic exam in last 12 months as risk factors. In addition, age of women should be examined, as we found a significant interaction between age and religious affiliation, similar to one found by Kramer et al. (2007) (3). However, with the sparse outlier data, we were not able to examine this interaction effect.

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# TABLES

**TABLE 1**. Selected characteristics of women age 15 -44 who have had an abortion and are at risk of unintended pregnancy by religious affiliation, NSFG, 2011-2013.

| | All[1] (n=428) | | | None (n=122) | | Catholic (n=75) | | Fundamentalist Protestant (n=57) | | Mainline Protestant (n=174) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **χ2 pvalue[a]** |
| **Noncontracepting Behavior** | 241 | 56.3 | 4.4 | 61.8 | 6.9 | 67.4 | 7.8 | 62.3 | 8.3 | 46.0 | 6.4 | 0.07 |
| **Number of Abortions** | | | | | | | | | | | | |
| **1** | 298 | 75.4 | 2.9 | 75.0 | 5.4 | 74.7 | 6.0 | 61.8 | 9.6 | 80.0 | 4.4 | 0.28 |
| **2+** | 130 | 24.6 | 2.9 | 25.0 | 5.4 | 25.3 | 6.0 | 38.2 | 9.6 | 20.0 | 4.4 | |
| **Age** | | | | | | | | | | | | |
| **<20** | 14 | 2.7 | 0.8 | 2.2 | 1.1 | 1.9 | 1.9 | 1.3 | 1.3 | 3.8 | 1.6 | 0.98 |
| **20-24** | 71 | 12.5 | 1.6 | 10.7 | 2.8 | 10.9 | 3.5 | 14.1 | 5.0 | 14.0 | 3.0 | |
| **25-29** | 120 | 25.9 | 3.6 | 31.4 | 7.1 | 18.3 | 7.1 | 23.3 | 6.3 | 24.9 | 5.5 | |
| **30-34** | 91 | 22.2 | 3.4 | 21.9 | 5.8 | 25.6 | 7.7 | 19.2 | 6.8 | 22.0 | 5.9 | |
| **35+** | 132 | 36.8 | 3.8 | 33.7 | 7.4 | 43.3 | 9.0 | 42.1 | 9.5 | 35.3 | 6.7 | |
| **Parity** | | | | | | | | | | | | |
| **0** | 125 | 31.0 | 3.9 | 40.6 | 7.7 | 38.6 | 8.3 | 16.4 | 4.8 | 24.8 | 6.2 | 0.22 |
| **1** | 135 | 28.0 | 3.2 | 26.7 | 5.5 | 31.5 | 7.2 | 39.5 | 9.7 | 24.2 | 4.6 | |
| **2** | 100 | 25.5 | 3.9 | 21.0 | 6.3 | 14.8 | 8.0 | 33.1 | 9.5 | 30.6 | 7.0 | |
| **3+** | 68 | 15.6 | 3.3 | 11.6 | 5.1 | 15.2 | 4.4 | 11.1 | 4.6 | 20.3 | 5.5 | |
| **Race/Ethnicity** | | | | | | | | | | | | |
| **White non-Hispanic** | 112 | 19.8 | 3.4 | 23.3 | 6.9 | 48.5 | 8.3 | 16.3 | 5.0 | 7.3 | 2.4 | <.0001 |
| **Black non-Hispanic** | 141 | 48.9 | 4.5 | 56.1 | 6.9 | 43.1 | 8.2 | 71.6 | 6.9 | 38.1 | 7.7 | |
| **Other non-Hispanic** | 143 | 23.9 | 3.5 | 11.1 | 3.5 | 5.8 | 2.6 | 8.7 | 3.6 | 45.4 | 7.2 | |
| **Hispanic** | 32 | 7.4 | 1.5 | 8.8 | 2.6 | 2.7 | 1.7 | 3.4 | 2.6 | 9.2 | 3.3 | |
| **Education** | | | | | | | | | | | | |
| **Less than high school** | 59 | 9.7 | 1.6 | 7.5 | 2.3 | 11.5 | 3.2 | 9.4 | 3.6 | 10.9 | 3.3 | 0.23 |
| **High school degree** | 127 | 30.1 | 3.7 | 43.6 | 7.0 | 21.7 | 8.9 | 31.1 | 7.2 | 22.0 | 4.4 | |
| **Some college/ associates** | 165 | 41.1 | 3.5 | 24.6 | 6.1 | 45.4 | 9.5 | 37.0 | 8.4 | 46.1 | 6.0 | |
| **College** | 77 | 19.1 | 3.1 | 14.4 | 4.6 | 21.4 | 5.8 | 22.5 | 7.9 | 21.0 | 5.3 | |
| **Union Status** | | | | | | | | | | | | |
| **Married** | 85 | 26.3 | 4.0 | 21.6 | 5.7 | 27.8 | 8.3 | 29.5 | 9.6 | 28.6 | 6.9 | 0.76 |
| **Cohabitating** | 79 | 20.6 | 3.4 | 27.1 | 7.0 | 17.3 | 6.4 | 21.8 | 8.6 | 16.1 | 4.9 | |
| **SEP/DIV/WID** | 55 | 13.8 | 3.2 | 8.8 | 5.0 | 22.3 | 7.8 | 15.2 | 5.2 | 14.3 | 5.3 | |
| **Never Married** | 209 | 39.3 | 3.6 | 42.5 | 6.7 | 32.6 | 6.4 | 33.4 | 7.9 | 41.0 | 6.8 | |
| **Poverty Level** | | | | | | | | | | | | |

| | All[1] (n=428) | | | None (n=122) | | Catholic (n=75) | | Fundamentalist Protestant (n=57) | | Mainline Protestant (n=174) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **%** | **SE** | **χ2 pvalue[a]** |
| **<100%** | 151 | 28.7 | 3.5 | 24.8 | 5.6 | 19.9 | 4.7 | 33.3 | 7.4 | 33.7 | 6.8 | 0.60 |
| **100-199%** | 100 | 23.2 | 3.4 | 24.1 | 6.3 | 23.4 | 5.3 | 15.9 | 4.4 | 24.6 | 6.9 | |
| **200% or more** | 177 | 48.1 | 3.9 | 51.1 | 7.4 | 56.6 | 6.7 | 50.8 | 7.7 | 41.7 | 6.4 | |
| **Insurance Coverage** | | | | | | | | | | | | |
| **Private** | 179 | 48.6 | 4.0 | 33.4 | 6.1 | 65.4 | 5.9 | 34.9 | 8.6 | 59.0 | 6.2 | <0.001 |
| **Public** | 157 | 28.9 | 3.5 | 30.2 | 5.5 | 14.7 | 3.0 | 41.6 | 9.7 | 29.2 | 5.6 | |
| **None** | 92 | 22.5 | 3.6 | 36.4 | 7.6 | 19.9 | 5.8 | 23.6 | 7.5 | 11.8 | 3.4 | |
| **Number of male sexual partners in past 3 months** | | | | | | | | | | | | |
| **0** | 104 | 22.9 | 2.6 | 25.6 | 6.4 | 24.8 | 8.5 | 22.8 | 6.4 | 20.1 | 3.5 | 0.87 |
| **1** | 288 | 69.9 | 3.4 | 68.8 | 7.0 | 71.1 | 8.6 | 71.0 | 6.5 | 70.1 | 5.7 | |
| **>1** | 36 | 7.2 | 1.7 | 5.6 | 2.2 | 4.1 | 2.5 | 6.2 | 2.9 | 9.8 | 3.5 | |
| **Number of male sexual partners over lifetime** | | | | | | | | | | | | |
| **1** | 15 | 2.5 | 0.8 | 4.0 | 1.4 | 0.6 | 0.6 | 1.3 | 1.0 | 2.2 | 1.3 | 0.13 |
| **2-3** | 47 | 9.4 | 1.8 | 5.0 | 1.9 | 15.7 | 5.6 | 14.9 | 8.5 | 9.1 | 1.9 | |
| **4-5** | 83 | 22.1 | 3.7 | 16.1 | 3.8 | 22.3 | 8.1 | 15.9 | 6.5 | 28.8 | 7.1 | |
| **6-9** | 97 | 21.1 | 2.9 | 24.6 | 6.7 | 29.7 | 6.4 | 18.7 | 5.8 | 15.8 | 3.6 | |
| **>= 10** | 186 | 45.0 | 4.0 | 50.3 | 6.7 | 31.1 | 6.4 | 49.2 | 9.7 | 44.1 | 5.8 | |
| **Received pap smear/ pelvic exam in past 12 months** | | | | | | | | | | | | |
| **No** | 188 | 42.6 | 4.1 | 55.9 | 6.0 | 37.0 | 8.1 | 48.8 | 9.6 | 31.9 | 4.8 | 0.005 |
| **Yes** | 240 | 57.4 | 4.1 | 44.1 | 6.0 | 63.0 | 8.1 | 51.2 | 9.6 | 68.1 | 4.8 | |
| **Born Outside the US** | | | | | | | | | | | | |
| **No** | 386 | 89.9 | 2.3 | 89.1 | 4.7 | 77.8 | 8.4 | 96.2 | 2.2 | 93.0 | 2.8 | 0.07 |
| **Yes** | 42 | 10.1 | 2.3 | 10.9 | 7.7 | 22.2 | 8.4 | 9.8 | 2.2 | 7.0 | 2.8 | |

**TABLE 2.** Selected characteristics of women age 15 -44 who have had an abortion and are at risk of unintended pregnancy by noncontracepting behavior, NSFG, 2011-2013.

| | All[1] (n=428) | | | Noncontracepting Behavior (n=241) | | |
|---|---|---|---|---|---|---|
| | No. | % | SE | % | SE | χ2 p-value |
| **Number of Abortions** | | | | | | |
| **1** | 298 | 75.4 | 2.9 | 53.8 | 5.3 | 0.25 |
| **2+** | 130 | 24.6 | 2.9 | 63.9 | 7.0 | |
| **Age** | | | | | | |
| **<20** | 14 | 2.7 | 0.8 | 53.7 | 14.2 | 0.08 |
| **20-24** | 71 | 12.5 | 1.6 | 34.0 | 6.7 | |
| **25-29** | 120 | 25.9 | 3.6 | 59.0 | 6.9 | |
| **30-34** | 91 | 22.2 | 3.4 | 50.5 | 8.1 | |
| **35+** | 132 | 36.8 | 3.8 | 65.6 | 8.7 | |
| **Parity** | | | | | | |
| **0** | 125 | 31.0 | 3.9 | 59.8 | 5.9 | 0.02 |
| **1** | 135 | 28.0 | 3.2 | 67.8 | 5.0 | |
| **2** | 100 | 25.5 | 3.9 | 36.3 | 9.3 | |
| **3+** | 68 | 15.6 | 3.3 | 61.4 | 11.3 | |
| **Race/Ethnicity** | | | | | | |
| **White non-Hispanic** | 112 | 19.8 | 3.4 | 65.0 | 8.1 | 0.50 |
| **Black non-Hispanic** | 141 | 48.9 | 4.5 | 52.7 | 7.0 | |
| **Other non-Hispanic** | 143 | 23.9 | 3.5 | 59.4 | 6.2 | |
| **Hispanic** | 32 | 7.4 | 1.5 | 46.5 | 12.2 | |
| **Education** | | | | | | |
| **Less than high school** | 59 | 9.7 | 1.6 | 58.6 | 9.1 | 0.03 |
| **High school degree** | 127 | 30.1 | 3.7 | 69.8 | 4.9 | |
| **Some college/ associates** | 165 | 41.1 | 3.5 | 47.5 | 6.2 | |
| **College Degree +** | 77 | 19.1 | 3.1 | 52.8 | 9.4 | |
| **Union Status** | | | | | | |
| **Married** | 85 | 26.3 | 4.0 | 43.0 | 8.5 | 0.15 |
| **Cohabitating** | 79 | 20.6 | 3.4 | 60.5 | 8.4 | |
| **SEP/DIV/WID** | 55 | 13.8 | 3.2 | 50.6 | 12.3 | |
| **Never Married** | 209 | 39.3 | 3.6 | 65.0 | 5.1 | |
| **Poverty Level** | | | | | | |
| **<100%** | 151 | 28.7 | 3.5 | 57.8 | 6.6 | 0.92 |
| **100-199%** | 100 | 23.2 | 3.4 | 53.8 | 8.3 | |
| **200% or more** | 177 | 48.1 | 3.9 | 56.6 | 5.9 | |
| **Insurance Coverage** | | | | | | |
| **Private** | 179 | 48.6 | 4.0 | 46.5 | 5.8 | 0.0013 |
| **Public** | 157 | 28.9 | 3.5 | 62.3 | 4.1 | |

| | All[1] (n=428) | | | Noncontracepting Behavior (n=241) | | |
|---|---|---|---|---|---|---|
| | No. | % | SE | % | SE | χ2 p-value |
| **None** | 92 | 22.5 | 3.6 | 69.7 | 7.0 | |
| **Number of male sexual partners in past 3 months** | | | | | | |
| **0** | 104 | 22.9 | 2.6 | 73.0 | 7.6 | 0.06 |
| **1** | 288 | 69.9 | 3.4 | 50.7 | 5.7 | |
| **>1** | 36 | 7.2 | 1.7 | 57.6 | 12.7 | |
| **Number of male sexual partners over lifetime** | | | | | | |
| **1** | 15 | 2.5 | 0.8 | 52.3 | 13.8 | 0.15 |
| **2-3** | 47 | 9.4 | 1.8 | 63.5 | 7.5 | |
| **4-5** | 83 | 22.1 | 3.7 | 47.9 | 9.6 | |
| **6-9** | 97 | 21.1 | 2.9 | 46.0 | 7.9 | |
| **>= 10** | 186 | 45.0 | 4.0 | 63.9 | 5.8 | |
| **Received pap smear/ pelvic exam in previous 12 months** | | | | | | |
| **No** | 188 | 42.6 | 4.1 | 72.0 | 4.4 | <.0001 |
| **Yes** | 240 | 57.4 | 4.1 | 44.6 | 5.2 | |
| **Born Outside the US** | | | | | | |
| **No** | 386 | 89.9 | 2.3 | 57.8 | 4.4 | 0.28 |
| **Yes** | 42 | 10.1 | 2.3 | 43.1 | 13.4 | |

[a]Chi-square p-value refers to the hypothesis test that the proportion of the demographic variable examined is similar across non-contraceptors

**TABLE 3.** Adjusted and crude odds ratio (OR) for noncontracepting behavior among US women age 15 -44 who have had an abortion and are at risk for unintended pregnancy, NSFG, 2011-2013.

| | **Model 1[a] Fully Adjusted - Gold Standard** | | **Model 2[b] Reduced Model** | | **Model 3[c] Crude Model** | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| Religious Affiliation | | | | | | |
| None (referent) | 1.00 | -- | 1.00 | -- | 1.00 | -- |
| Catholic | 2.60 | *0.74 - 9.11* | 2.77 | *0.83- 9.29* | 1.28 | *0.51- 3.22* |
| Fundamentalist Protestant | 1.30 | *0.48 - 3.52* | 1.20 | *0.48- 3.00* | 1.02 | *0.42- 2.51* |
| Mainline Protestant | 0.79 | *0.32- 1.98* | 0.90 | *0.41- 1.98* | 0.53 | *0.26- 1.08* |

[a]Odds for noncontracepting by religious affiliation adjusted for previous number of abortions, age, parity, race/ethnicity, education, union status, poverty level, current health insurance status, number of male sexual partners in the past 3 months, number of male sexual partners over lifetime, received pap smear and/or pelvic exam in past 12 months, and born outside the US

[b]Odds for noncontracepting by religious affiliation adjusted for age, parity, education, union status, current health insurance status, number of male sexual partners in the past 3 months, number of male sexual partners over lifetime, received pap smear and/or pelvic exam in past 12 months, and born outside the US

[c]Odds for noncontracepting by religious affiliation

# APPENDIX

**TABLE 1.** An examination of multivariable logistic models adjusted for different covariates. This table was made using backward elimination to determine which models best represented the association between religious affiliation and noncontracepting behavior. The crude and fully adjusted models were chosen to demonstrate the difference. The reduced model chosen (Model 2) was chosen as all three ORs for religious affiliation were within 10% of the fully adjusted and it had the tightest confidence interval ratio.

| # VS | VS IN MODEL | OR 1 VS 0[A] | OR 2 VS 0[B] | OR 3 VS 0[C] | < 10% GS? |
|---|---|---|---|---|---|
| **12** | ALL | 2.60 | 1.30 | 0.79 | --- |
| **11** | ALL - ABORTION COUNT | 2.61 | 1.30 | 0.80 | Yes |
| **11** | ALL - Poverty | 2.60 | 1.28 | 0.78 | Yes |
| **10** | ALL - ABORTION COUNT, Poverty | 2.60 | 1.27 | 0.78 | Yes |
| **9** | ALL - ABORTION COUNT, Poverty, born out | 2.55 | 1.37 | 0.84 | Yes |
| **9** | ALL - ABORTION COUNT, Poverty, Hisprace | 2.77 | 1.20 | 0.90 | Yes |
| **9** | ALL - ABORTION COUNT, Poverty, rmarital | 2.34 | 1.25 | 0.75 | Yes |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, born out | 2.68 | 1.31 | 0.95 | 2/3 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital | 2.45 | 1.17 | 0.90 | 2/3 |
| **8** | ALL - ABORTION COUNT, Poverty, rmarital, born out | 2.26 | 1.37 | 0.81 | 2/3 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, bornout | 2.32 | 1.30 | 0.97 | 2/3 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, curr_ins | 2.10 | 1.13 | 0.81 | 1/3 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins | 2.28 | 1.26 | 0.85 | 1/3 |

| # VS | VS IN MODEL | OR 1 VS 0[A] | OR 2 VS 0[B] | OR 3 VS 0[C] | < 10% GS? |
|---|---|---|---|---|---|
| **7** | ALL - ABORTION COUNT, Poverty, rmarital, born out, curr ins | 1.93 | 1.33 | 0.72 | 2/3 |
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital | 1.97 | 1.26 | 0.88 | (1/3)-(2/3) |
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, nump3mos | 1.96 | 1.20 | 0.80 | 2/3 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, lifeprtner | 1.75 | 1.40 | 0.92 | 1/3 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos | 1.74 | 1.22 | 0.84 | 2/3 |
| **4** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr | 1.60 | 1.32 | 0.88 | 2/3 |
| **3** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. hieduc | 1.44 | 1.28 | 0.75 | 2/3 |
| **2** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity | 1.62 | 1.13 | 0.69 | No |
| **1** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager | 1.61 | 1.11 | 0.67 | No |
| **0** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager, female_services12 | 1.28 | 1.02 | 0.53 | No |

[a]OR1 represents the odds ratio between Catholics and No Religious Affiliation (reference)
[b]OR2 represents the odds ratio between Fundamentalist Protestants and No Religious Affiliation (reference)
[c]OR3 represents the odds ratio between Mainline Protestant and No Religious affiliation (reference)
[d]abortion count is the number of previous abortions a woman has had

[e]poverty is the woman's poverty level
[f]hisprace is the woman's race and ethnicity
[g]rmarital is the woman's marital status
[h]born out is whether or not the woman was born outside the US
[i]curr_ins is current health insurance status
[j]nump3mos is the number of male sexual partners in the past 3 months
[kl]ifprtner is the number of male sexual partners over lifetime
[l]hieduc is highest educational level/degree attained
[mp]arity is number of prior births a women has had
[n]ager is defined as the age of the women (categorization defined in methods)
[o]female_services12 is defined as having received a pap smear and/or pelvic exam in past 12 months

**Table 2.** An examination of multivariable logistic models adjusted for different covariates, examining just Catholics (OR 1) vs. No Religious Affiliation (OR 0, reference group).

| # OF VS | VS IN MODEL[A] | OR 1 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **12** | ALL | 2.60 | 0.74 | 9.11 | 8.36 | 12.25 |
| **11** | ALL - ABORTION COUNT | 2.61 | 0.78 | 8.70 | 7.92 | 11.13 |
| **11** | ALL - Poverty | 2.60 | 0.73 | 9.21 | 8.47 | 12.54 |
| **10** | ALL - ABORTION COUNT, Poverty | 2.60 | 0.77 | 8.79 | 8.01 | 11.39 |
| **9** | ALL - ABORTION COUNT, Poverty, born out | 2.55 | 0.79 | 8.21 | 7.41 | 10.35 |
| **9** | ALL - ABORTION COUNT, Poverty, Hisprace | 2.78 | 0.83 | 9.29 | 8.47 | 11.26 |
| **9** | ALL - ABORTION COUNT, Poverty, rmarital | 2.34 | 0.76 | 7.20 | 6.44 | 9.47 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, born out | 2.68 | 0.83 | 8.69 | 7.86 | 10.53 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital | 2.45 | 0.82 | 7.35 | 6.53 | 9.00 |
| **8** | ALL - ABORTION COUNT, Poverty, rmarital, born out | 2.26 | 0.78 | 6.55 | 5.77 | 8.42 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, bornout | 2.32 | 0.81 | 6.68 | 5.87 | 8.25 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, curr_ins | 2.10 | 0.74 | 5.93 | 5.18 | 7.97 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins | 2.28 | 0.75 | 6.98 | 6.24 | 9.35 |
| **7** | ALL - ABORTION COUNT, Poverty, rmarital, born out, curr ins | 1.93 | 0.71 | 5.21 | 4.50 | 7.32 |
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital | 1.97 | 0.74 | 5.25 | 4.50 | 7.06 |

| # OF VS | VS IN MODEL[A] | OR 1 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, nump3mos | 1.96 | 0.67 | 5.75 | 5.08 | 8.58 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, lifeprtner | 1.75 | 0.67 | 4.55 | 3.88 | 6.77 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos | 1.74 | 0.65 | 4.64 | 3.98 | 7.09 |
| **4** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr | 1.60 | 0.62 | 4.14 | 3.53 | 6.72 |
| **3** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. hieduc | 1.44 | 0.54 | 3.84 | 3.30 | 7.15 |
| **2** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr, Hieduc, parity | 1.62 | 0.66 | 3.96 | 3.31 | 6.02 |
| **1** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager | 1.61 | 0.64 | 4.05 | 3.41 | 6.32 |
| **0** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager, female_services12 | 1.28 | 0.51 | 3.22 | 2.72 | 6.37 |

[a]Variables are defined in Appendix Table 1.

**Table 3.** An examination of multivariable logistic models adjusted for different covariates, examining just Fundamentalist Protestants (OR 2) vs. No Religious Affiliation (OR 0, reference group).

| # OF VS | VS IN MODEL[A] | OR 2 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **12** | ALL | 1.30 | 0.48 | 3.52 | 3.04 | 7.33 |
| **11** | ALL - ABORTION COUNT | 1.30 | 0.50 | 3.39 | 2.89 | 6.84 |
| **11** | ALL - Poverty | 1.28 | 0.48 | 3.39 | 2.91 | 7.04 |
| **10** | ALL - ABORTION COUNT, Poverty | 1.27 | 0.50 | 3.28 | 2.79 | 6.63 |
| **9** | ALL - ABORTION COUNT, Poverty, born out | 1.37 | 0.51 | 3.67 | 3.16 | 7.14 |
| **9** | ALL - ABORTION COUNT, Poverty, Hisprace | 1.20 | 0.48 | 3.00 | 2.51 | 6.19 |
| **9** | ALL - ABORTION COUNT, Poverty, rmarital | 1.25 | 0.46 | 3.38 | 2.92 | 7.35 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, born out | 1.31 | 0.50 | 3.43 | 2.93 | 6.87 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital | 1.17 | 0.44 | 3.11 | 2.67 | 7.08 |
| **8** | ALL - ABORTION COUNT, Poverty, rmarital, born out | 1.37 | 0.48 | 3.87 | 3.38 | 8.02 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, bornout | 1.30 | 0.46 | 3.66 | 3.20 | 7.95 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, curr_ins | 1.13 | 0.41 | 3.08 | 2.67 | 7.49 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins | 1.26 | 0.47 | 3.39 | 2.92 | 7.23 |
| **7** | ALL - ABORTION COUNT, Poverty, rmarital, born out, curr ins | 1.33 | 0.45 | 3.87 | 3.42 | 8.55 |
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital | 1.26 | 0.43 | 3.68 | 3.24 | 8.51 |

| # OF VS | VS IN MODEL[A] | OR 2 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, nump3mos | 1.20 | 0.49 | 2.92 | 2.43 | 5.93 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, lifeprtner | 1.40 | 0.47 | 4.22 | 3.75 | 9.05 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos | 1.22 | 0.47 | 3.17 | 2.70 | 6.72 |
| **4** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr | 1.32 | 0.49 | 3.59 | 3.10 | 7.35 |
| **3** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. hieduc | 1.28 | 0.49 | 3.35 | 2.86 | 6.85 |
| **2** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr, Hieduc, parity | 1.13 | 0.47 | 2.76 | 2.30 | 5.94 |
| **1** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager | 1.11 | 0.45 | 2.72 | 2.27 | 5.99 |
| **0** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager, female_services12 | 1.02 | 0.42 | 2.51 | 2.09 | 6.04 |

[a]Variables are defined in Appendix Table 1.

**Table 4.** An examination of multivariable logistic models adjusted for different covariates, examining just Mainline Protestants (OR 3) vs. No Religious Affiliation (OR 0, reference group).

| # OF VS | VS IN MODEL[A] | OR 3 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **12** | ALL | 0.79 | 0.32 | 1.98 | 1.66 | 6.23 |
| **11** | ALL - ABORTION COUNT | 0.80 | 0.33 | 1.90 | 1.57 | 5.71 |
| **11** | ALL - Poverty | 0.78 | 0.32 | 1.89 | 1.57 | 5.85 |
| **10** | ALL - ABORTION COUNT, Poverty | 0.78 | 0.34 | 1.81 | 1.47 | 5.32 |
| **9** | ALL - ABORTION COUNT, Poverty, born out | 0.84 | 0.36 | 1.93 | 1.57 | 5.35 |
| **9** | ALL - ABORTION COUNT, Poverty, Hisprace | 0.90 | 0.41 | 1.98 | 1.57 | 4.88 |
| **9** | ALL - ABORTION COUNT, Poverty, rmarital | 0.75 | 0.34 | 1.69 | 1.36 | 5.04 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, born out | 0.95 | 0.43 | 2.08 | 1.65 | 4.84 |
| **8** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital | 0.90 | 0.42 | 1.91 | 1.48 | 4.50 |
| **8** | ALL - ABORTION COUNT, Poverty, rmarital, born out | 0.81 | 0.36 | 1.82 | 1.46 | 5.04 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, bornout | 0.97 | 0.46 | 2.04 | 1.58 | 4.42 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, rmarital, curr_ins | 0.81 | 0.38 | 1.71 | 1.32 | 4.45 |
| **7** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins | 0.85 | 0.39 | 1.87 | 1.48 | 4.83 |
| **7** | ALL - ABORTION COUNT, Poverty, rmarital, born out, curr ins | 0.72 | 0.32 | 1.63 | 1.31 | 5.13 |
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital | 0.88 | 0.42 | 1.84 | 1.43 | 4.43 |

| # OF VS | VS IN MODEL[A] | OR 3 VS 0 | 95% CI | | CI WIDTH | CI RATIO |
|---|---|---|---|---|---|---|
| **6** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, nump3mos | 0.80 | 0.37 | 1.73 | 1.35 | 4.62 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, lifeprtner | 0.92 | 0.42 | 2.02 | 1.60 | 4.82 |
| **5** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos | 0.84 | 0.41 | 1.72 | 1.31 | 4.17 |
| **4** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr | 0.88 | 0.42 | 1.84 | 1.42 | 4.38 |
| **3** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. hieduc | 0.75 | 0.37 | 1.53 | 1.16 | 4.15 |
| **2** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr, Hieduc, parity | 0.69 | 0.33 | 1.46 | 1.14 | 4.50 |
| **1** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager | 0.67 | 0.33 | 1.35 | 1.02 | 4.11 |
| **0** | ALL - ABORTION COUNT, Poverty, Hisprace, born out, curr ins, rmarital, nump3mos, lifprtnr. Hieduc, parity, ager, female_services12 | 0.53 | 0.26 | 1.08 | 0.82 | 4.18 |

[a]Variables are defined in Appendix Table 1.