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**The Impact of Gender Role Attitudes on
Sterilization Decisions**

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Abstract

Researchers have suggested that gender role attitudes may influence couples' decisions about sterilization. I tested these ideas using a sample of married, non-Hispanic white men and women drawn from Waves I and II of the National Survey of Families and Households. Wife's and husband's gender role attitudes were marginally significant in affecting sterilization rates. Couples in which the wife held more traditional attitudes had higher rates of sterilization, while couples with more traditional husbands had lower sterilization rates. Husband's education affected the risk of sterilization, suggesting it might be valuable to take husband's characteristics into account in future research.

Introduction

In the past three decades, sterilization has become an increasingly widespread method of permanently ending childbearing. Presser and Bumpass (1972) documented the widespread disapproval of sterilization in the 1965 National Fertility Survey; in 1965, only eight percent of currently married couples with the wife under 45 years of age and the husband present were contraceptively sterilized, or 12 percent of married couples with the wife under 45 who intended no more children (Bumpass and Presser 1972). By the late 1960s, the prevalence of sterilization had started a dramatic climb to current high levels. Data from the 1995 cycle of the National Survey of Family Growth (NSFG) show that 41.1 percent of currently married women aged 15-45 or their husbands had been sterilized. While levels of hysterectomy among currently married women of childbearing age remained fairly constant around 7 percent from 1965 to 1995, tubal sterilization increased from 3.9 to 23.8 percent and vasectomy increased from 3.6 to 14.9 percent during this time period (Chandra 1998).

Most sterilizations occur within unions, usually a marriage. This means that when one partner is sterilized, the other partner's births are also limited, as long as the couple remains together. It also means that to end childbearing, both partners theoretically have the choice between male or female sterilization. In practice, however, this choice is made under the constraints of the relationship and the characteristics of both partners. These dynamics of sterilization bring a key feature of the couple's relationship, gender ideology, to the forefront of sterilization decisions. The couple's gender role attitudes could influence whether a male versus female procedure is chosen as the method of sterilization and could influence the likelihood of either partner being sterilized.

Gender role attitudes and sterilization

Although vasectomy is much safer, less invasive, easier to perform, and less expensive than female methods of sterilization, women continue to be sterilized far more frequently than men.

Traditional gender role ideologies may be associated with a belief that control of fertility is a woman's responsibility or with a belief that vasectomy is an emasculating procedure or will reduce the male sex drive. If this view of gender role ideologies is accurate, men with traditional gender role attitudes may be less likely to obtain a vasectomy than men with egalitarian attitudes; if their wives are unwilling or unable to undergo sterilization, these traditional views of gender roles could also affect the likelihood of whether the couple uses any form of sterilization. Since female sterilization is more widely accepted, women's gender role ideologies may have no influence on the choice of male versus female sterilization.

Alternatively, women with egalitarian gender ideologies may more actively advocate for their husbands to share responsibility for fertility by undergoing vasectomy. Finally, women's traditional gender role attitudes could have a dampening effect on overall levels of sterilization if they are less likely to approve of permanently ending the capacity for childbearing through sterilization.

There has been limited support thus far for the hypothesis that egalitarian attitudes influence sterilization. Shain, Miller, and Holden (1985) found that men who had participated in contraception (primarily through condom use) prior to sterilization were more likely to choose vasectomy. Miller, Shain, and Pasta (1991) also concluded that use of diaphragm, condom, or other methods (compared to use of IUD or withdrawal) predicted higher odds of vasectomy. These studies implicitly or explicitly use contraceptive methods as a proxy for adherence to the norm of female responsibility for contraception and fertility. Other research (Bean et al. 1987; Forste, Tanfer, and Tedrow 1995) has analyzed whether relationships heterogamous by age, religion, education, and race were more likely to

obtain a sterilization or a vasectomy, given a sterilization. These studies argued that heterogamous couples exhibit less traditional attitudes, but results for whether heterogamous couples were more likely to obtain a sterilization or a vasectomy in particular were mixed.

While several of these investigators have interpreted their findings as addressing gender role attitudes, they have not had direct measures of gender attitudes. Instead, they have relied on other measures, such as heterogamy or contraceptive use, to infer that gender ideologies were involved. In addition, some previous studies of sterilization used local-area samples, often convenience samples drawn from select populations such as clinic patients or insurance subscribers (Miller et al. 1991; Shain et al. 1985). Some studies did not include any couples not choosing sterilization (Miller et al. 1991; Shain et al. 1985), and some did not include self-reports from each spouse (Shain et al. 1985). To address the limitations of previous research, in this study I use nationally representative data to test direct measures of gender role attitudes rather than using proxies, self-reported by each spouse. I find limited support for the hypothesis that husbands with traditional gender role attitudes have lower rates of sterilization overall, but couples in which the wife holds more traditional attitudes have increased rates of sterilization.

Data and Measures

This study uses data from Waves I (1987-88) and II (1992-94) of the National Survey of Families and Households (NSFH1 and NSFH2, respectively). The NSFH is a national probability sample of 13,007 respondents, which represents a 74 percent response rate in the first wave of the study. Several groups relevant to this study, including persons recently married, were over-sampled. In Wave I, one adult per household was randomly selected to be the primary respondent in a face-to-face interview. In addition, a shorter, self-administered questionnaire was given to the spouse or cohabiting

partner. In the Wave II follow-up, 10,007 respondents were successfully re-interviewed (a 77% response rate), and in this second round, spouses and cohabiting partners were also administered (in a face-to-face interview) the same instrument given to primary respondents. (See Sweet, Bumpass, and Call (1988) and Sweet and Bumpass (1996) for a complete description of the NSFH sample and study design.) As described further below, the first interview includes reports from each spouse about gender role attitudes. In the second interview, respondents reported births and sterilizations between interviews. In this study, I predict sterilization between interviews from data gathered at the first interview.

The sample for this study is limited to respondents who were married and living with their spouse at the first interview and who participated in the second interview. I restricted the sample to couples in which neither spouse was sterilized at NSFH1. Sterilization questions were asked in the first interview only if the wife was under 40 years of age, so I also restricted the sample based on the wife's age at NSFH1. Respondents were excluded if they indicated at the second interview that they were pregnant or intended another child, since respondents who intend future childbearing are not yet at risk for sterilization. I also restricted the sample to those couples with only shared children. Results were similar, but effects of gender attitudes stronger, when couples who had children prior to the NSFH1 marriage were included and controls for each spouse's children were modeled. For clarity of presentation results for the restricted sample are given here.

One of the drawbacks of the NSFH data for this study is that—in spite of double sampling of racial and ethnic minority groups—there were too few cases of sterilization (especially vasectomy) among members of minority groups to test for racial or ethnic variation in the determinants of sterilization. Although racial differentials in use of methods of sterilization are dramatic and in need of

explanation, because of these sample limitations my analysis is based on the sample of white, non-Hispanic respondents who met the criteria described above. The resulting sample included 912 couples, comprised of 404 male and 508 female primary respondents.

The sterilization measure for this analysis was drawn from the second interview, in which questions about sterilization were asked of respondents who were not pregnant, had not indicated that they intended to have another child, and who were females under 45 or males with a spouse/partner under 45. These questions were: “Since (NSFH1 date), have you had an operation that makes it impossible to have a child?....Since (NSFH1 date), has your (husband/wife/partner) had an operation that makes it impossible to have a child?” If the respondent or his/her current spouse had been sterilized, the date of the sterilization was obtained. If the respondent separated from or divorced his or her NSFH1 spouse between interviews, I obtained data regarding sterilization status and timing from the personal interviews with both the primary respondent and the ex-spouse.

The major limitation of the NSFH data on sterilization is that respondents were not asked what types of operations they underwent or reasons for doing so. For men, this is not problematic, because few sterilizing operations besides vasectomies are performed on men at younger ages. However, for female respondents, this lack of specificity is troublesome because I cannot distinguish hysterectomies (or other sterilizing operations) from tubal sterilizations. However, evidence from the 1995 NSFG suggests that this may not be a fatal flaw. Weighted tabulation of female sterilizations by sterilization type shows that approximately 85 percent of women who had at least one sterilizing operation underwent a tubal sterilization. Respondents classified 68 percent of all female sterilizations as solely contraceptive in intent. Another 7 percent of operations were performed for both medical and contraceptive reasons, and 24 percent were performed for medical reasons only. (Respondents did not

provide reasons for 2 percent of these operations.) These data suggest that while the NSFH question is certainly not ideal, the vast majority of female sterilizations are performed with at least some contraceptive intent. The inclusion of hysterectomies in my sterilization variable should create random “noise” and may attenuate estimated effects of gender role attitudes on contraceptive sterilization.

The gender role attitude measure used in this study is the mean of responses to five items which were included in a self-administered module of the main interview at NSFH1. Respondents and spouses indicated approval of “Mothers who work full-time when their youngest child is under age 5,” “Children under 3 years old being cared for all day in a day care center,” and “Mothers who work part-time when their youngest child is under age 5,” and agreement with the statements, “It is much better for everyone if the man earns the main living and the woman takes care of the home and family,” and “Preschool children are likely to suffer if their mother is employed.” All items were coded so that higher scores reflected more traditional gender role attitudes, and all items were rescaled so that the responses ranged from 1 to 5. I constructed husband and wife versions of this variable, standardizing the scale within sex to a mean of zero. Chronbach’s $\alpha=0.834$ for the male respondents and $\alpha=0.832$ for female respondents for this scale. The correlation between husband and wife scales was 0.58. Preliminary analysis of several categorizations of the distribution of these variables suggested that results did not differ substantially when the scales were modeled as linear composites. For ease of interpretation, results from these linear composites are reported here. An interaction of the husband’s and wife’s attitudes was not significant in any model.

In each model, I controlled for several sociodemographic predictors of sterilization that may be sources of spurious relationships between gender role attitudes and sterilization. These include wife’s age at start of risk for sterilization (defined below), each spouse’s education completed at the first

interview, whether either spouse is Catholic (measured at the first interview), number of biological children at start of risk, and major Census region at first interview. I included wife's age in all models, including those predicting vasectomy, because wife's age determines number of childbearing years remaining. None of the variables in the model are allowed to vary over time.

Many other variables that have previously been suggested as theoretically important explanatory variables were also considered for inclusion as control variables, but were found to be nonsignificant. These were subsequently excluded from the final tests of the variables of interest to this study.¹

Methods

This study uses a Cox proportional hazards model to examine variation in rates of sterilization. In preliminary analyses, I used logistic regression to predict sterilization status at NSFH2, with essentially the same results as reported below. The model for choice between vasectomy and female sterilization, given a couple's utilization of any sterilization, necessarily remains a logistic regression. A hazard model is used primarily for its ability to address censoring in the data. Most previous sterilization studies have been limited by using cross-sectional data, which confuses temporal ordering of events. Restricting longitudinal data to couples who were continuously married throughout the duration of the study would bias the sample toward couples which are more stable. The Cox model facilitates including respondents who separate between interviews by right censoring them at the date of separation, divorce, or death. Their characteristics are included in the model for as long as the marriage is intact.

¹ The variables considered and then rejected include whether the respondent had ever had an unwanted birth or a birth "too soon" (i.e., sooner than intended, possibly due to a contraceptive failure, whether this was a first marriage, urban residence at NSFH1, wife's work status at NSFH1, number of previous marriages, family structure at age 15, and a measure of whether the household income was below 1.5 times the poverty level at the time of the first interview. I was unable to evaluate the importance of

One key issue in an event history analysis is when the respondent enters risk for the event of interest. Because sterilization is a permanent method of contraception, exposure to risk for sterilization begins when the decision to have no more children has been made. However, I do not have data on the exact date when a respondent decides he or she wants no more children. Undoubtedly, the process of making this decision occurs over a period of time. Some people will have made the decision to have no more children before the birth of their last child. Some may decide on sterilization even before conception, if they know they definitely want one more (and only one more) child, although they obviously cannot act upon this decision until conception. Others will not decide they want no more children until several years have passed since their last birth.

Given the conceptual difficulty in deciding when exposure to risk for sterilization begins, I approximated date of onset of risk by the birth date of the primary respondent's last wanted child. In part, this was due to the fact that although decisions can be made about sterilization options, a man cannot obtain a sterilization until after conception and a woman cannot be sterilized until birth of the child. A birth between NSFH1 and NSFH2 was determined to be wanted if the primary respondent answered "yes" to the question asked about each birth between interviews, "Just before that pregnancy began, did you yourself want to have (a/another) baby at SOME time?" Some exceptions to the last-wanted-birth dating rule should be noted (see Appendix A for more detail). If there were no wanted births between the two interviews (approximately 35 percent of the sample), I dated entry to risk at the date of the last birth before NSFH1. Only 25 of these respondents (approximately 3 percent of the sample) reported their last child before NSFH1 to be unwanted. In the approximately 10 percent of

another variable that has been suggested to be related to sterilization behavior, prior contraceptive use. The NSFH did not collect data on contraceptive methods.

cases where respondents had no children and indicated that they did not intend to have any in the future, I estimated that exposure time started at the date of the marriage to the NSFH1 spouse. If entry to risk for sterilization occurred either before marriage to the NSFH1 spouse or after separation from the NSFH1 spouse, I dropped the case from the analysis because fertility decisions were presumably not made in conjunction with the partner on whom I have data.

The Cox model also facilitates left truncation of cases for which risk for sterilization began before the first interview. Left truncation is different from left censoring because the date of entry to risk is known. Truncation is necessary because I do not know the values of the independent variables of interest prior to the first interview date. Essentially, left truncation includes respondents in the model starting at the time of the NSFH1 interview, but at the correct time of exposure. Left truncating should help reduce or eliminate any selection bias due to the fact that these respondents have survived longer exposure periods (i.e., to the first interview) without a sterilizing operation.

On the other hand, the sterilizations observed for the group which entered risk for sterilization between interviews (which are not truncated) may represent a disproportionate number of “early” sterilizations. Approximately 65 percent of my sample had their last wanted birth (and hence entered risk for sterilization) after the first interview, which leaves them a short duration at risk before the second interview. Bumpass, Thomson, and Godecker (2000) found that three-quarters of sterilizations occur within five years of the last wanted birth, and that rates of sterilization are highest for both men and women in the first year after the last wanted birth. The event history model ensures that this group of respondents does not bias the results (as it might in a logistic regression of the same outcome), by taking these respondents’ short exposure time into account.

Risk for sterilization ends (and duration of exposure time is determined) at the date of sterilization or when a censoring event occurs. Cases were censored under two circumstances. For most respondents, the censoring event was the NSFH2 interview. Respondents who experience a marital disruption before their own or their spouse's sterilization or NSFH2 were censored at the date of separation or death of spouse.

Results

The analytic sample included 912 couples in which the primary respondent was white and non-Hispanic. In these couples, 130 husbands (14.3 percent) and 148 wives (16.2 percent) were sterilized between NSFH1 and NSFH2.² Table 1 provides descriptive statistics for the variables of interest in the analysis. Approximately 16 percent of wives were under 25 years of age, while 36 percent were 30-34 years old, when the respondent had his or her last wanted child. Most wives and husbands had at least some college experience, and approximately one-third of both husbands and wives had at least a college degree. In almost two-thirds of couples, neither spouse was Catholic, while approximately 17 percent of couples had both Catholic wives and husbands. About half of couples had two biological (all shared) children when they had their last wanted child and entered risk for sterilization. The remaining couples were split between having zero or one child(ren) and having three or more children. Couples were fairly evenly distributed throughout the four major census regions, except that only approximately 16 percent of the sample resided in the West region at the time of the NSFH1 interview. Recall that the

² These estimates are lower than those reported in Chandra (1998) for the same data due to the sample restrictions imposed here. Recall that these are sterilizations between NSFH1 and NSFH2 to couples who indicated (at NSFH2) that they desired no more children and who were not already sterilized by NSFH1, while Chandra reported the percentage of all currently married women aged 15-44 who had ever had a tubal sterilization.

gender role scale was standardized with a mean of zero (standard deviation = .77), so it is not included in Table 1.

-----Table 1 about here-----

Couples reporting any sterilization

As a first look at gender role attitudes, I used the Cox proportional hazards model to predict *any* sterilization in the couple, disregarding whether this was a male or female sterilization. Couples who are less traditional might be expected to have higher rates of sterilization if more traditional couples are less certain about their decision to have no more children or feel that sterilization may reduce femininity or masculinity. Results from these models are presented in Table 2, columns 1 and 2. Coefficients from the Cox models are exponentiated in the table to facilitate interpretation. These exponentiated coefficients represent the rate of sterilization for one group relative to the omitted group; for instance, a value of 2.0 suggests that one group has a rate of sterilization twice that of the omitted group.

Husband's and wife's gender role attitudes were marginally significant ($p < .10$, two tailed test) in affecting sterilization rates. Couples with husbands who have more traditional gender role attitudes are significantly less likely to obtain sterilizations. The relative risk for husbands' attitudes is .81, which means that an increase of one point on the attitude scale (higher is more traditional) decreased sterilization rates by 19 percent. This suggests that husbands have significant input into the couple's sterilization decisions. Men who express attitudes that women should be home with their children when they are young and that couples are better off when men work and women are at home may also be most likely to view contraception and fertility as the wife's responsibility and thus be more averse to accepting any responsibility themselves through sterilization. The effect of wife's attitude was of the same magnitude but in the opposite direction: with a relative risk of 1.20, an increase of one point on

the gender attitude scale leads to a 20 percent increase in the risk for sterilization. Taken together, these results may suggest that couples' sterilization rates may be lower overall due to lower rates of vasectomy. This possibility can be explored further in the models that follow. For all of the Cox models reported here, effects for both husbands' and wives' attitudes were in the same direction, but weaker and non-significant, when included in models with only husbands' or only wives' attitudes (results not shown).

-----Table 2 about here-----

Results from the control variables agree with findings from previous literature and do not change when the gender role attitude variable is omitted from the models. Rates of sterilization are highest when the wife is aged 25-29, suggesting the desire to protect against an unplanned pregnancy during the 10-20 years between completion of childbearing and menopause. Wife's education has no relationship to whether the couple chooses some form of sterilization, likely because increased education lowers the rate of female sterilization but raises the rate of vasectomy. Couples in which the husband had at least a college degree had significantly lower rates of sterilization. Whether either spouse was Catholic was not related to sterilization rates. Parity was strongly related to rates of sterilization, however. Couples with two or more children at the time of their last wanted birth had rates of sterilization at least twice as high as those with no children or one child at entry to risk for sterilization. Given that all of these respondents indicated that they did not intend to have any more children, this strong parity effect suggests that those with more children are more certain about that decision. Region of residence is also related to sterilization rates, with rates highest in the southern Census region.

Part of the difficulty in predicting *any* sterilization is that several variables might be operating in different directions depending on the type of sterilization. In order to sort out these relationships, I used event history analysis to predict female sterilizations and vasectomies separately.

I included respondents who were not sterilized in this analysis. Many researchers have treated sterilization decision-making as a two-stage process, whereby a couple first decides that one of them will get sterilized and then decides which one of them it will be. These researchers only compare couples who chose some form of sterilization when looking at factors that predict choice of male versus female methods. I do not think that the decision to obtain a sterilization is always such a two-stage process. It is likely that for many people, the decision to obtain a sterilization is considered simultaneously with evaluation of who would be the partner to undergo the operation. That is, the question may be, “Do *I* want a sterilization,” rather than, “Do *we* want to get sterilized.” This may be particularly true for women, since men have lower rates of vasectomy.³ The wife might know, from previous conversation or just general knowledge of her husband, that he will not obtain a vasectomy and that if she wants to end childbearing through sterilization, it will be she who gets sterilized. If this is the case, then the relevant comparison group for sterilized women is women who did not obtain a sterilization, rather than couples who chose vasectomy. In addition, only through comparison to unsterilized respondents can I address whether sterilized women are more traditional than all women. In

³ The increasing number of never-married women who have been contraceptively sterilized supports the interpretation that for many women, at least, the decision does not involve a partner. Data from the 1995 NSFG indicate that 9 percent of never married women using contraception are relying on female sterilization (Abma et al. 1997), up from 6 percent in 1988 (Mosher 1990). Analyses by Bumpass et al. (2000) of the same data indicate that 31 percent of women under 40 years of age who were sterilized in 1990-1995 were not married at the time of sterilization.

the final analysis below, I also address whether, given a sterilization, couples who chose female sterilization differ from couples who chose male sterilization.

Female sterilization

For these models, I used a Cox proportional hazards model to predict female sterilization. I censored cases when a husband got sterilized, when the marriage dissolved, or at the time of the second interview. Results in these analyses differed somewhat from the predictions of sterilization reported above. Estimates of relative risk for variables in these models are presented in Table 2, columns 3 and 4.

Husband's and wife's gender role attitudes did not significantly affect rates of female sterilization. Although it was expected that more traditional wives would have higher rates of sterilization than more egalitarian women, this hypothesis is not supported. Although not significant, the magnitude of the effects for wives and husbands attitudes is similar to that for the analysis reported above. They are in the direction suggesting that more traditional wives are more likely to be sterilized, while wives with more traditional husbands are less likely to be sterilized.

Results for the control variables are similar to those for models predicting any sterilization. Women who are older when they complete their wanted childbearing are less likely to be sterilized than women in their late 20s. Neither wife's nor husband's education or religion had a significant affect on the rate of female sterilization. Parity at the time of birth of the last wanted child strongly affected sterilization rates, with those with two or more children having rates of sterilization over two and a half times higher than those with no children or one child. Women in the South had the highest rates of female sterilization.

Male sterilization

To further clarify the relationships suggested above in the first analysis, I also conducted a hazard analysis of vasectomy. Again, I censored on spouse's sterilization. Results for these models are reported in Table 2, columns 5 and 6. This sample should provide the most clear exploration of the relationship of gender role attitudes to sterilization, since vasectomies, unlike female procedures, are only done for contraceptive reasons.

Gender role attitudes did not significantly affect the likelihood of vasectomy. However, here we see the same pattern as for other models. The direction of the coefficients, although not significant, are consistent with the results for the analysis of any type of sterilization: conservative husbands lowered sterilization rates, while conservative wives raised vasectomy rates. Recall that for all analyses presented, results were similar (although the effects were weaker) when wives' and husbands' attitudes were entered into the models separately.

Results for the control variables were also similar to other models, with a few exceptions. Unexpectedly, husband's education had a curvilinear relationship to the likelihood of vasectomy. Husbands with at least some college education had rates of sterilization about 40 percent lower than those with a high school degree. Perhaps these men are more successful at effectively participating in other forms of contraception, rendering vasectomy unnecessary. Men with less than a high school degree had a rate of sterilization one-tenth that of husbands with a high school diploma. These men may be the most uninformed about the risks and benefits of vasectomy, and thus particularly unlikely to choose this method of contraception. The effect of parity on vasectomy was significant, but not as strong as for rates of female sterilization. Rates of vasectomy were highest in the central Census region.

Female versus male sterilization

To examine the hypothesis that if either spouse in a more traditional couple is sterilized, it will be the wife, I restricted the sample to the couples who reported any sterilization between interviews. Here, I used a logistic regression to predict vasectomy, conditional on whether any sterilization was reported between NSFH1 and NSFH2. In these analyses, I ignored information about duration of risk. Of the 278 couples who obtained a sterilizing operation, 148 chose female sterilization, while 130 chose vasectomy. Results for these models are reported in Table 2, columns 7 and 8.

Although it has been hypothesized egalitarian attitudes predict choice of vasectomy as a method of sterilization, these results do not support that thesis. Neither the husband's nor the wife's gender role attitudes were significant predictors of vasectomy. Thus results from the previous section suggest that husbands' traditional attitudes lower, and wives' traditional attitudes raise, sterilization rates overall, but do not affect which method is chosen, given any sterilization.

Results for the control variables differ somewhat in this model from results reported above. Wife's age, the couple's parity, and region of residence do not affect type of sterilization, once the sample is restricted to those couples who chose some form of sterilization. This suggests that these variables influence whether the couple chooses any form of sterilization, but not which type. Couples in which the wife was more educated were more likely to choose vasectomy, while couples in which the husband had either less than a high school diploma or had some college were less likely to choose vasectomy than couples in which the husband had a high school degree. If the wife was Catholic but the husband was non-Catholic, the couple had rates of vasectomy only 25 percent the rate of vasectomy for couples with two Catholic spouses.

Discussion and Conclusion

In general, there was limited support for the hypothesized relationships between gender role attitudes and sterilization. Husbands who were more conservative in their views of women's work and child care had lower rates of sterilization overall. Looking at the other analyses, it seems that this may be due to both lower rates of female and male sterilizations. In each of the event history models, an increase of one point on the gender role attitude scale, towards being more traditional, resulted in a 20 percent decrease in the sterilization rate. Although results were significant at the $p < .10$ level only for the models for any sterilization, preliminary research suggests that these effects are real. Not only are they consistent, but when couples who did not have only shared children were included—and controls for his, hers, and their children added—estimates of the coefficients for all models were similar, and the coefficients for the models for any sterilization and for vasectomy were significant (results not shown). Men who are more conservative in their gender role attitudes may be less supportive of using sterilization because they feel that it is wrong to permanently rule out future childbearing. These men may also be particularly averse to vasectomy.

It also seems that couples with more traditional wives may have higher rates of sterilization. Results from the event history analyses indicate that each increase in the gender role attitude scale produced a 20 percent increase in the rate of sterilization. Only the effect for the equation modeling whether the couple obtained any sterilization approached significance, however, and none of these effects were significant in models including couples with some children who were not shared. If it were real, this effect of the wife's attitude would be unexpected. I predicted that wives with more traditional gender attitudes would have lower rates of sterilization overall, but given any sterilization, it would be more likely to be a female procedure. Evidence from these analyses does not support either of those predictions. Taken all together, the analyses suggest that more traditional women have higher utilization

of both female and male sterilization, leading to higher rates of sterilization overall (although only the coefficient for this last component, higher rates of sterilization overall, was marginally significant).

This research, while suggestive in some ways, is certainly not definitive. Effects for gender role attitudes were consistent, but not always significant. Results do indicate that male participation is important in the sterilization decision-making process. Both husband's gender role attitudes and education had important influences on sterilization rates. This sample was limited to couples in which the primary respondent was white and non-Hispanic. The disparities in types of sterilization that are present for whites are more dramatic for other racial and ethnic groups. Further research is needed—with better sterilization measures—to establish whether the effects suggested here can be confirmed and whether they can explain differentials in other populations as well.

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Table 1: Distribution of Sample Across Variables Included in Analysis

Variable	n=	Weighted %
Wife's Age at Entry to Risk		
< 25 years	150	15.5
25-29 years	297	30.7
30-34 years	318	36.3
35+ years	147	17.5
Wife's Education at NSFH1		
less than high school	40	4.4
high school/GED	297	32.8
some college	250	25.7
college or more	287	32.5
Missing	38	4.6
Husband's Education at NSFH1		
less than high school	44	4.2
high school/GED	251	26.5
some college	218	23.0
college or more	312	36.4
Missing	87	9.9
Religion at NSFH1		
both spouses Catholic	148	16.8
neither Catholic	600	65.5
wife Catholic, husband not	87	9.4
husband Catholic, wife not	77	8.3
Number of Children at Entry to Risk		
0-1	241	24.5
2	455	50.1
3 or more	216	25.3
Region of Residence at NSFH1		
northeast	205	24.8
central	311	31.3
south	263	28.2
west	133	15.6

Table 2: Results from Cox Proportional Hazards and Logistic Regression Models

	Any sterilization		Female sterilization	
	Relative Risk	Relative Risk	Relative Risk	Relative Risk
Gender Role Attitudes				
wife	1.20 +		1.17	
husband	0.81 +		0.83	
wife missing	0.82		1.09	
husband missing	0.86		0.90	
Wife's Age at Entry to Risk				
< 25 years	1.02	1.04	0.79	0.81
25-29 years	1.00	1.00	1.00	1.00
30-34 years	0.69 *	0.70 *	0.78	0.79
35+ years	0.44 ***	0.44 ***	0.44 **	0.44 **
Wife's Education at NSFH1				
less than high school	0.99	1.02	1.18	1.16
high school/GED	1.00	1.00	1.00	1.00
some college	0.81	0.84	0.66	0.67
college or more	1.16	1.19	0.78	0.80
missing	0.58	0.59	0.33	0.32
Husband's Education at NSFH1				
less than high school	0.74	0.72	1.26	1.25
high school/GED	1.00	1.00	1.00	1.00
some college	0.77	0.80	0.95	0.99
college or more	0.63 *	0.65 *	0.70	0.72
missing	0.94	0.89	1.36	1.34
Religion at NSFH1				
both spouses Catholic	1.00	1.00	1.00	1.00
neither Catholic	0.96	0.95	1.13	1.12
wife Catholic, husband not	0.97	1.00	1.59	1.66
husband Catholic, wife not	0.88	0.83	0.67	0.64
Number of Children at Entry to Risk				
0-1	1.00	1.00	1.00	1.00
2	1.92 ***	1.84 **	2.67 ***	2.57 **
3 or more	3.30 ***	3.18 ***	4.85 ***	4.67 ***
Region of Residence at NSFH1				
northeast	1.00	1.00	1.00	1.00
central	1.29	1.31	0.89	0.90
south	1.73 *	1.71 *	2.20 *	2.21 *
west	1.42	1.43	1.27	1.29
-Log Likelihood	1461.78	1464.65	728.65	729.67

+p<=.10; *p<=.05; **p<=.01; ***p<=.001

Table 2: Results from Cox Proportional Hazards and Logistic Regression Models (continued)

	Vasectomy		Vasectomy, given any sterilization	
	Relative Risk	Relative Risk	Odds	Odds
Gender Role Attitudes				
wife	1.19		0.97	
husband	0.80		1.05	
wife missing	0.51		0.26 +	
husband missing	0.86		0.76	
Wife's Age at Entry to Risk				
< 25 years	1.27	1.31	1.60	1.65
25-29 years	1.00	1.00	1.00	1.00
30-34 years	0.61 *	0.60 *	0.78	0.79
35+ years	0.44 **	0.43 **	1.12	1.10
Wife's Education at NSFH1				
less than high school	0.65	0.68	0.47	0.50
high school/GED	1.00	1.00	1.00	1.00
some college	1.02	1.06	1.94 +	1.63
college or more	1.74 +	1.81 *	3.51 **	3.16 **
missing	0.98	0.98	3.27	3.25
Husband's Education at NSFH1				
less than high school	0.10 *	0.10 *	0.12 +	0.11 *
high school/GED	1.00	1.00	1.00	1.00
some college	0.61 *	0.63 +	0.54 +	0.55
college or more	0.57 *	0.59 +	0.76	0.82
missing	0.61	0.56	0.53	0.51
Religion at NSFH1				
both spouses Catholic	1.00	1.00	1.00	1.00
neither Catholic	0.85	0.84	0.72	0.70
wife Catholic, husband not	0.48	0.49	0.25 *	0.25 *
husband Catholic, wife not	1.06	0.97	2.23	1.58
Number of Children at Entry to Risk				
0-1	1.00	1.00	1.00	1.00
2	1.46	1.40	0.63	0.64
3 or more	2.43 **	2.34 **	0.47	0.50
Region of Residence at NSFH1				
northeast	1.00	1.00	1.00	1.00
central	1.75 *	1.79 *	1.98	2.24 +
south	1.21	1.18	0.49	0.54
west	1.55	1.54	1.40	1.45
-Log Likelihood	707.70	709.86	164.07	166.14

+p<=.10; *p<=.05; **p<=.01; ***p<=.001

Appendix A: Definition of Entry to Risk for Sterilization

General Rule: Use date of last wanted birth as date of entry to risk for sterilization.

Exceptions	Resolution	Effect on Exposure Time Estimate
Last wanted birth prior to NSFH1 interview	Use date from last birth before NSFH1 interview	Underestimates duration of risk for 25 cases whose last birth before NSFH1 interview was unwanted
Respondent had no children and intended none in the future	Use date of marriage to NSFH1 spouse	Underestimates exposure for those who decided not to have children prior to marriage. Overestimates exposure for those who decided not to have children after marriage
Respondent intended to have more children at NSFH1 interview, but first child after that interview was reported unwanted	Use date halfway between NSFH1 interview date and the date of the child's birth	Undetermined when decision was made not to have more children
Respondent reported his/her husband's vasectomy a few months before birth of last wanted child	Recode exposure time from negative value to one month	Overestimates exposure time for these few cases
Respondent did not intend to have more children at NSFH1 interview, but reported a wanted birth after that interview	Drop case from sample	Unable to estimate exit and reentry to risk for sterilization
Last wanted birth prior to marriage to NSFH1 spouse	Drop case from sample	Decision to end childbearing may have been made without NSFH1 spouse, making that spouse's characteristics irrelevant
Last wanted birth after separated from NSFH1 spouse	Drop case from sample	Decision to end childbearing was made without NSFH1 spouse, making that spouse's characteristics irrelevant

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