Gender Differences in Evaluations of Contraceptive Methods

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A large body of existing research investigating the contraceptive decision making of couples in intimate heterosexual relationships posits that their method choices are based at least in part on the method-related expectancies and values of the two partners (for example, Fishbein and Azjen 1975). That is, each partner is conceptualized as evaluating the probabilities of experiencing various consequences associated with using different contraceptive methods (expectancies) and also assessing the utility (value) or disutility they would experience if each outcome occurred. The partners then choose the method type that maximizes their joint expected utility. While this conceptualization is appealing, and the research using it offers important insights into the method selection process, such research leaves two important gaps in our knowledge. First, there has been little research directed at understanding how the expectancies and values formed by the partners combine to determine their preference level for each of the multiple methods that are part of their choice set. Such information is necessary for us to develop an understanding of which specific characteristics of use (e.g., the risk of unintended pregnancy, level of interference with sexual pleasure) are the primary determinants of each method's acceptability. Second, we know little about which of these dimensions tend to produce partner differences in method preferences. If there are gender differences in the values associated with certain characteristics of use or differences in how methods are assessed on those characteristics, partner differences in preferences may result and must be negotiated when the couple's method selection process. In this paper, we begin to bridge these gaps in our knowledge. Specifically, we use data from the newly available National Couples Survey (NCS) of 1,009 couples to examine how specific value-weighted expectancies are related to each partner's method preference ratings and also determine how these weighted expectances contribute to gender differences in these ratings. This analysis is made possible because the NCS obtained identical detailed information from both partners on method-related expectancies, values and preferences as well as on other personal and relationship characteristics.

Background

Most existing studies of contraceptive behavior acknowledge the importance of method characteristics. However, in many of these studies such characteristics only implicitly enter the analysis. For example, some examinations of condom use model use of that method as a function of the individual's perceptions of AIDS risk and severity (Bettinger et al. 2004; Catania et al. 1992; Galavotti and Schell 1994; Klepinger et al 1993), implicitly assuming that those factors operate through their impact on the value placed on the condoms efficacy in reducing the risk of HIV infection. Similarly, the negative association between age and O.C. pill use found in many studies is often assumed to be a function of the user's assessment of the health risks associated with its use (e.g., Grady et al. 2002).

Another large body of research explicitly incorporates method-related characteristics of use by defining specific expectancies and values associate with the use of the method being considered, but uses these only to define value-weighted expectancies that serve as indicators of an underlying construct usually labeled "attitude toward the behavior" (Dilorio et al. 2000; LaBrie et al. 2002; Noar and Morokoff 2002). Although such analyses inform us about whether the expectancies and values include in the analysis are, as a set, good predictors of method use or intention to use, they provide little of no information about how specific characteristics of use are related to those outcomes. Neither do these studies provide information about how gender and other personal characteristics are related to method-related expectancies and values.

Those studies that do explicitly consider the characteristics of method use also have important limitations. Most importantly, they do not examine how method characteristics are related to the method preferences of individuals. Rather, they examine either how those characteristics are related to whether individuals use the method (Beckman et al. 1992, 1996; Boyd and Wandersman 1991; Campbell, Peplau, and DeBro 1992; Condelli 1986; DiIorio et al. 2001; Glor and Severy 1990; Houser and Beckman 1978; Pleck, Sonnenstein, and Ku 1990; 1993; St. Lawrence 1993; Tanfer and Rosenbaum 1986) or how they are related to how

individuals rate the relative acceptability of two or more methods on each characteristic (Frezieres et al. 1998; Frezieres and Walsh 2000; Kulczyki et al. 2004). Examining whether characteristics of use are related to method choice only partly captures their effects on the method preferences of individuals. That is, their choice is also affected by the preferences of their partner. For example, in their examination of how the method preferences of each partner are related to a couple's method choice, Grady et al. (2007) show that the partners in a sexual relationship often differ in their method preferences and that the preferences of each partner have independent effects on their method choice as a couple.

Current acceptability research also has limitations. In much of this research, the acceptability of each of a set of characteristics, often mechanical aspects of use, is assessed individually to determine barriers and/or incentives to use (see the review by Elias and Coggins 2001). Alternatively, two or more methods, such as the male and female condoms, are compared as to their acceptability on each aspect of use and their relative acceptability is assessed (e.g., Kulczyki et al. 2004). Such acceptability measures are specific to the methods being compared and thus are not generalizable preference measures. What is needed is a measure that has a comparable meaning across all method types and encompasses only the individuals own assessments. In the analysis presented here, we use 100-point preference scale on which respondents were asked to provide their "overall ratings" of different methods, where a score of 0 on the scale meant that the method has only disadvantages and no advantages and a score of 100 meant that it has only advantages and no advantages.

Another, smaller body of research defines method related expectancies and values as outcomes, and examines how personal characteristics, including gender, are related to these outcomes. Among these studies, most examine beliefs and values related to condom use and they generally consider the effects of only one or two personal characteristics. Race and ethnic differences in perception were explored by Campbell, Peplau, and DeBro (1992), who found none, and by Norris and Ford (1992) who found many differences between black and Hispanic

adolescents. Analyses by St. Lawrence (1993) and Campbell, Peplau, and DeBro (1992) investigated gender differences in perceptions about condoms and found that females perceived the condom more positively with respect to both its effects on sexual experience and its "interpersonal impact." The St. Lawrence study also found that women more positively rated the condom's comfort and convenience. Brown (1984) investigated gender differences but found no significant effects of gender on any dimension. Grady et al. (1993) considered a wider range of personal characteristics and found significant differences by age, race, education and marital/relationship status, but the analysis included only adult males and could not investigate gender differences in perceptions. It is also important to note that the value of all of this research for understanding how personal characteristics are related to expectancies and values is reduced by the fact that the condom is considered in isolation from all other methods. For example, although this research has shown that the condom is perceived to be effective in preventing unintended pregnancy (Bernard et al. 1989; Strader and Beaman 1989), it cannot identify whether the condom is perceived to be more or less effective than other methods that may comprise an individual's choice set.

Among the few studies that do consider a wider choice set of contraceptive methods is a very early study by Downs (1977) who demonstrated a gender discrepancy in method preferences. However, the premise underlying this research is that the discrepancy results from differences in the value placed on various method characteristics and not on differences in perceptions about those characteristics. The same assumption is apparent in the study by Cohen, Severy, and Ahtola (1978) who listed general characteristics on which individuals might compare contraceptive methods (e.g., "Being able to control if and when you have children"), asked individuals to rate how "salient" each characteristic was to them when considering specific method types, and investigated gender differences in how these ratings are related to attitudes toward different methods. However, most methods require greatly different actions on the part of men and women and it would be expected that they would view them differently in

terms of such expectancies of use as convenience, need to plan ahead, and interference with sexual pleasure. Methods also have discrepant health implications for men and women. We therefore might expect a gender difference in both expectancies and values associated with different method types.

Evidence of such gender differences is offered in the study by Grady et al. (1999). They compare men and women in terms of the expectancies and values they assign to an array of methods and find systematic differences. As an example, they show that women rank pregnancy prevention as the single most important contraceptive characteristic when choosing a method, and they rank side effects associated with use as the second most important characteristic. In contrast, men indicate that STD prevention for themselves and their partner is just as important as pregnancy protection, and rank STD prevention as more important than side effects. In terms of method-related expectancies, the results of that analysis suggest that women have more favorable perceptions than men about the pill, and generally less favorable perceptions about other nonpermanent methods, including the condom.

Although these results suggest that men and women differ in their method-related expectancies and values, how they combine to affect gender differences in preferences for different method types remains uninvestigated. That is, the analysis by Grady et al. (1999) examined gender differences <u>separately</u> for measures of expectancies and values and only speculated about how they may combine to affect the relative attractiveness of or preferences for each method. Specifically, they assumed that the method expectancy ratings of individuals of individuals who identified a characteristic as being very important has a bigger impact on method preferences than those of individuals who rate it as less important (i.e., a lower utility). However, as we will demonstrate, this is not necessarily the case. For instance, if women who highly value effective pregnancy protection tend to all rate the pill very highly on that dimension (producing little variance in it), their valuation will be highly positively related to their preference for the pill but their expectancy rating of the pill on that characteristic may be only weakly related

to their preference rating. In order to understand how gender differences in expectancies and values are related to differences in method preferences we must model their separate and joint effects on a measure of method preferences that has comparable meaning across individuals and across methods. Such information is important because contraception is often a couple decision, the outcome of which may be influenced by the nature of those effects. Our goal in this study is to address this gap in our knowledge.

In pursuing this goal, it is also important that this study uses data from couples and not separate samples of men and women. Even though the examination of partner differences is not the explicit goal of the study, having identical information from both partners allows us to use statistical techniques to control for unobserved heterogeneity that derives from such factors as couple communication about contraceptive method characteristics. Thus our results are less subject to such biases and provide critical, accurate information about the relationship between the method preferences of men and women and their method-related values and expectancies.

Data

For this study, we use data from the National Couples Study (NCS) that were collected as part of two on-going NIH-funded studies examining couples' contraceptive decision making (but not consistency of use). Completed interviews were obtained from both partners of 413 married couples, 261 cohabiting couples and 335 dating non-cohabiting heterosexual couples, where the female is age 20 to 35 years and the male is age 18 or older. Other eligibility criteria are that the female is not currently pregnant, postpartum, or trying to get pregnant, and where both partners are neither medically nor surgically sterile (for whom consistency of contraceptive use is of limited interest. The dating couples are not included in this analysis in order to simplify our analyses. Dating couples are more likely than their married and cohabiting counterparts to be facing the dual threats of unintended pregnancy and disease acquisition and thus the process by which couples form preferences for different method types appears to substantially diverge

for the two groups. Therefore our analyses are based on data obtained from 674 married and cohabiting couples (1,348 individuals).

The survey used computer-assisted self interviewing (CASI) to collect data from an area probability sample of household residents in four cities and their adjacent county subdivisions: Baltimore, MD; Durham, NC; St. Louis, MO; and Seattle, WA. These four cities were chosen for substantive and pragmatic reasons. On the pragmatic side, they are where Battelle has survey research offices, making the survey much more cost efficient. Substantively, these sites provide diverse populations with respect to race, ethnicity, economic status and other factors influencing sexual and contraceptive decision making. Within the four study sites, we stratified segments by percent black and over-sampled segments with high minority concentrations to obtain the desired allocation of black and non-black couples across the four sites. Participants were recruited through door-to-door visits from female interviewers.

During the survey effort, 65% of households were successfully rostered for eligibles (i.e., all adults living in the household were listed by age and marital status), with potential eligible respondents located in 27% of rostered households. Where more than one age-eligible couple and/or unattached adult was present, we randomly selected a couple or unattached adult and screened them for eligibility. If the selected person was married or cohabiting, we screened the female partner in the couple for eligibility, and had an 83% screening rate. Eligibility screening was completed for 79% of focal respondents. Overall, 72% of eligible married/cohabitating couples completed the survey.

At the interviewing stage, partners were scheduled to take the survey contemporaneously, usually at their residence. The questionnaires for males and females are nearly identical. Field interviewers took two laptop computers to the home and set up the partners in separate spaces for the interview. Respondents were restricted from communicating with each other about their answers. The computer-assisted survey allowed us to capture and resolve data inconsistencies during the interview process. Overall, the rostering, screening, and interview response rates are

respectable, given the heavy burden of the survey on the participants, in that each member of the couple was asked to provide rather sensitive information about their private lives. Further, the requirement that both partners had to agree to participate also increased the chances for refusal, particularly among daters who had to recruit their non-resident partner for us, telling that person that s/he wanted to provide us with information about their sexual relationship and convincing the partner to do the same. It is important to note that this dataset is one of the few population based sample surveys of adult couples, and is larger the most others.

Measures

Because the measures used in this study are derived from couples data, for all of the personal characteristics and preferences we define identical measures for both the male and female partners and test both for inclusion in our statistical models. For relationship characteristics, we base our measures (including the method use outcome variable) on the reports of the female partner. We do this to maintain comparability with most prior research which is based on reports from women. The specific measures we use in this analysis are described below.

Method Preferences

Respondents were provided an introduction to the question used to obtain method preference ratings. This introduction stated that:

> "Now we are interested in your overall rating of different methods of birth control in terms of whether they have mostly advantages or mostly disadvantages. On a scale of 0 to 100, rate ach of the methods below. A rating of 2 or 5 man be 'almost no advantages and many disadvantages' …A rating of 98 or 99 may mean 'almost no disadvantages and many advantages.' You may enter any number between 0 and 100."

Respondents were then asked: "Overall how do you rate [METHOD] as a birth control method?" The methods they were asked about include the pill, condoms, the diaphragm, implants "such as the Norplant," injectables "such as Depo Provera," and "using no birth control method at all in terms of whether it has mostly advantage or mostly disadvantages?"

Method Values

Respondents were asked to use a five-point scale (1="not important at all" to 5= very important") to rate *how important* each aspect of birth control was to them. Specifically, they were asked: "In choosing a birth control method, how important is it that:

- It is highly effective in preventing pregnancy?
- It is highly effective in protecting you from sexually transmitted diseases?
- [FEMALE PARTNER] not experience a somewhat increased risk of a serious health problem such as a heart attack or cancer?
- It not give [FEMALE PARTNER] irregular monthly periods, spotting or cramps?
- [FEMALE PARTNER] not have problems getting pregnant getting pregnant within a year after stopping use of a method (an not using any other method)?
- [PARTNER] approve of using the method?
- It not require [SPOUSE] 's cooperation to use it?
- It is easy to use?
- You do not have to plan ahead when you or [SPOUSE] need to use it?
- It not interfere with romance or sexual pleasure?
- It not take you and [SPOUSE] extra time to learn how to use it.

Two questions about cost were preceded by the following introduction" In choosing a brth control method, how important is :

- How much money it costs you out-of-pocket to start using it (including the cost to you of clinic or doctor visits?
- How much money it costs you out-of-pocket to continue using it on a monthly basis?

Method Expectancies

Respondents were given an introduction that reads: "Next we would like to ask you about the percent chance that certain things would happen related to your using a particular birth control method.' For each of the method for which we obtained preference ratings, they were then asked: " What is the percent chance that":

- [FEMALE PARTNER] would become pregnant during the next year if [you/partner] were using [METHOD]?
- You would contract a sexually transmitted disease during the next year if [you/partner] were using [METHOD]?
- [METHOD] would give [FEMALE PARTNER] a serious health effect, such a a heart attack or cancer?
- [FEMALE PARTNER] could get pregnancy within a year of stopping use of [METHOD] if [FEMALE PARTNER] were trying to get pregnant?
- [METHOD] could give [FEMALE PARTNER] side effects such as headaches, mood swings, or weight gain?
- [METHOD] could give [FEMALE PARTNER] irregular monthly periods, spotting, or cramps?
- [PARTNER] would disapprove of using [METHOD]?
- [METHOD] would require [partner] to cooperate to use it?
- [METHOD] is so difficult to use that you would not want to use it?
- [METHOD] requires so much prior planning that there would be a time that you could not have sex when you want to?
- [METHOD] interferes with romance or sexual pleasure?

Note that for the last seven of these expectancies (starting with “side effects”) current and past users of each method were asked whether these consequences had ever occurred (yes/no) and not asked percent-chance expectancies. On the rating scales used in this analysis, they were assigned a 0% chance if they had never experienced the consequence of use, and a100% chance if it had occurred. The final two cost expectancies were introduced by the following text: “The next question asks you about dollar costs of different birth control methods. If you are not certain, please give us your best guess.” They were then asked:

- What [is/was] the fist time, up front cost (including any cost for a clinic or doctor vist) to start using [METHOD]?
- How much money each month [would/does] [METHOD] cost of of pocket?

Personal and Relationship Characteristics

Among the key individual characteristics, for both partners, included in this analysis are *age*, calculated in years based on respondents' self-reports of their month and year of birth. We operationalize *race/ethnicity* as a set of dummy variables indicating being Hispanic, non-Hispanic black, or non-Hispanic non-black, based on self-reports, including reports of primary racial identify among those specifying multiple races. We include a dummy variable indicating whether they *lived with both parents* in an intact family "most of the time" when they were age 14. Finally, we include two alternative measures of *religiosity*. The first of these is based on a series of dummy variables indicating whether the respondent is "very religious," somewhat religious," or "not religious at all." The second is measured as a set of dummies indicating frequency of attendance at religious services during the past year ("once a week or more often," 2-3 times a month," once per month," several times a year," occasionally," and "never." *Education* and *annual income* are also considered as control variables; their role as sources of power are assessed only when they are interacted with method preference ratings.

The primary relationship variable that we include in our models is *marital/relationship status*, using a dummy variable to differentiate couples who are married or cohabiting. We also include the *relationship duration*, defined as months since they started "seeing each other on a regular basis"

Analytic Approach

A unique feature of the research presented here is that the NCS contains reports made by each partner in the couple. We take advantage of reports by both partners by assessing whether there is unobserved heterogeneity at the couple level that may introduce bias in our estimates. Consider the following simple model:

$$R_{ijk} = \beta_{rm} D_{ijkm} + \beta_X X_i + \beta_Z Z_j + \lambda_j + e_{ijk},$$

where R_{ijk} is the rating of method *k* by person *i* in couple *j*, D_{ijk} is that person's rating of method *k* along dimension *m*, X_i are personal and Z_j are couple characteristics that are included as

controls, and λ_j is unobserved factors shared by the partners in couple *j*. If the unobserved heterogeneity (λ_j) is correlated with the dimension ratings (D_{ijkm}), then estimates of the effects of dimension rating on the overall rating of a method (β_{rm}) will be biased. For instance, assume that the couple-level unobserved heterogeneity is the extent to which couples discuss contraception. It seems likely that couples that discuss contraception more frequently will tend to influence each other's ratings of a method of contraception along many of its dimensions, as well as how each rates the method overall. Thus, the unobserved variable, here couple communication about contraception, affects both overall rating and dimension ratings, yielding a correlation between dimension ratings and the composite error term ($\lambda_j + e_{ijk}$). Couple communication about contraception would also probably yield closer agreement among partners on both the overall rating and on the dimension ratings, which would lead to biased estimates of the standard errors and liberal statistical tests, and could also bias parameter estimates. Any unobserved couple-level characteristic that affects both overall ratings and dimension ratings can lead to biased estimates. We estimate both fixed-effects models, that control for unobserved heterogeneity and adjust the standard errors for non-independence among partners in a relationship, and random-effects models that also adjust the standard errors for non-independence. We then use Hausman specification tests to assess whether unobserved heterogeneity introduces bias.

In estimating the empirical models, we tested two sets of models that employ different measures of how respondents assessed different methods of contraception along various relevant dimensions, as well as models that examine gender differences. Initially, we estimate models that include respondents' rating of each method along the relevant dimensions. For most dimension ratings, the measures are coded from zero to 100 (i.e., what is the probability that you will become pregnant in the next year while using method k). Some questions are worded such that a higher rating implies that respondents rate the methods along that dimension more favorably, while for other questions the reverse is true. To ease interpretation,

we have recoded response so that higher ratings imply a more favorable rating for all dimensions. We expect estimated coefficients to be positive for these dimension ratings. The exceptions are time, which is measured in minutes, and start-up costs and maintenance costs, which are measured in dollars. For these three dimensions we expect the estimated effects to be negative (i.e., higher perceived costs leads to a lower overall rating).

We then examine whether the effect of a dimension rating on the overall rating of a method varies by whether a person thought the dimension was very or quite important in selecting a method of contraception. Prior researchers have argued that ratings along dimensions that are more important to an individual should have more influence on their overall rating of a method or on their likelihood of using a method. In prior research this has usually been accomplished by weighting dimension ratings by indications of the importance of the dimension. However, importance is almost always measured via an ordinal scale and simply multiply a continuous (interval or ratio) variable, or in many cases another ordinal variables, by an ordinal variable imposes a very strong assumption that the resulting measure is an interval or ratio measure. In contrast, we add to the model which includes dimension ratings additional terms that are constructed by multiplying the dimension ratings by a dummy variable indicating whether a person felt this dimension was important. Our measure of importance is a five-point scale rated from “not at all important” (1) to “very important” (5). The dummy variable for importance is coded “1” if the respondent indicated that the dimension was “very important” (5) or “quite important” (4) when choosing a method of contraception. If importance rating of dimension ratings matters, then the effects of dimension ratings should be larger when that dimension is identified as being important, relative to unweighted dimension ratings.

Throughout the analyses, we also test for gender differences in how dimension ratings influence overall ratings. We expect that gender differences will arise because some methods, such as the pill, are “female” methods and some method, such as the condom, are “male” methods, and as such they impose different demands on men and women. Moreover, men and

women face different risk from exposure to STD's and face different costs to an unintended pregnancy, or greater aversion to interference with pleasure, ease of use, or the need to plan ahead.

Each of the method overall ratings measures are coded from zero to 100 and, except for using no method of contraception, there is little censoring at either end point. For use of no method, there was considerable censoring at zero (over 25% rated it as zero). Therefore, we employ regression methods for estimating the models for all methods of contraception, except for using no method, where we prefer using a Tobit procedure that will capture the left-censoring. However, the presence of bias due to unobserved heterogeneity precludes the use of a Tobit procedure for estimating models of the overall rating of no method because a fixed-effects procedure for Tobit does not exist. The Hausman tests based on regression models for overall rating of using no method were consistently and strongly rejected, and comparing point estimates of the fixed-effects estimator with those of the random-effects estimator revealed large biases in the random-effects estimator and substantially different qualitative results from those obtained from the fixed-effects estimator. In contrast, while there were differences in the point estimates from the random-effects regression estimator and the random-effects Tobit estimator (the Tobit point estimates are slightly larger, generally on the order of 5%, suggesting that the regression results are slightly downwardly biased and thus yield slightly conservative tests), the qualitative results from these two approaches were identical. Consequently, we chose to use the fixed-effects regression approach rather than a random-effects Tobit approach because the expect bias from censoring is substantially less than the bias from unobserved heterogeneity. Nevertheless, because of right censoring the estimates from the fixed-effects models for the overall rating of no method may be somewhat biased.

Finally, we restrict the analysis to married and cohabiting couples because we found the estimated effects to be vary substantially for dating and non-dating couples. This finding is not surprising since more committed couples face different risks of exposure to STD's and to the

costs of unintended pregnancy. Moreover, the importance of some dimensions such as partner acceptability and cooperation are likely to have different salience for dating than married and cohabiting couples. We found similar differences by relationship status in how overall ratings of methods influenced the method of contraception a couple chose to use.

Results

Descriptive Results

We begin with some descriptive results showing mean overall preference ratings and dimension ratings. As shown in the first row of Table 1, overall method ratings are highest for the pill and condom, which are rated nearly equally . Ratings of diaphragm, Norplant, and injectables are similar, but the preference rating of no method is much lower than for other method types. Men tend to rate all methods higher than women, with the largest differences observed for Norplant and injectables.

[Table 1 about here]

The last column of Table 1 shows the percentage of respondents who rated each dimension of method use as “important” or “very important” (4 or 5 on the scale). Examining these percentages shows that pregnancy prevention and serious health effects are the most important dimensions along which people rated methods. These are followed by minor health problems (e.g., weight gain), and partner approval, ease of use, and how much it interferes with pleasure. Issues like the need to plan ahead for use and the ability to get pregnant after stopping use are also important for more than half of respondents (63% and 62%, respectively). About half report that STD prevention, monthly costs, and start-up costs are important. Relatively few people report that cooperation of their partner is important**.**

The main panel of Table 1 contains expectancy ratings for methods on each dimension of use (with some percentages reverse coded such that more positive values indicate more positive expectancies). In general, looking a ratings across method types we find expected patterns. Respondents rate Norplant, the pill and injectables very highly for pregnancy

prevention, as measured by their expected risk of getting pregnant while using the method. Note however that they rate injectables only slightly lower than they rate the condom and diaphragm. No method is rated poorly on pregnancy prevention. Although condom is rated most highly for STD protection, all of the methods are rated quite highly along this dimension. This result is probably due to how the question intended to capture expectancies a about method's STD protection was worded. Respondents were asked the likelihood they would acquire an STD while using the method, and since the respondents in this analysis are all married or cohabiting, most respondents probably felt that they were at relatively low risk of acquiring and STD regardless of the degree of protection offered by the method.

Individuals rate the pill, Norplant, and injectables lower than other methods on whether they interfere with the ability to get pregnant within a year after use is ended. People indicate that they are less likely to need their partner's approval to use the pill (rate it higher on this dimension) than the other methods, but they indicate that they are more likely to need their partners' approval for using Norplant and injectables than they would for using the condom. People rate the pill more favorably on serious health consequences than they do either Norplant or injectables. The Norplant is rated more poorly than pill and injectables for minor health problems like weight gain, but all three are rated relatively poorly along this dimension. The condom and the diaphragm are rated more poorly than other methods for requiring cooperation from one's partner to use the method. Most of the methods are rated fairly highly for ease of use, except for the diaphragm, and the pill is rated most highly along this dimension. The same pattern is also seen for the need to plan ahead. The condom is rated most poorly for interfering with pleasure, followed by the diaphragm. All the other methods are rated highly along this dimension. The pill is rated as taking more time to learn to use than either the condom or the diaphragm. People believe that Norplant has the highest start-up costs, and condom the lowest. Condom is also rated as having the lowest monthly costs.

Effects of Expectancies on Method Preference Ratings

We begin our examination of the effects of dimension ratings on the overall rating of each of the six methods by presenting results from a model that examines the effects of respondents' ratings along each dimension, and that controls for a respondent's gender, age, race and ethnicity, education, income, and marital status (formally married), and the duration of their relationship. These results are presented in Table 2.

[Table 2 about here]

Hausman specification tests indicate that unobserved heterogeneity introduces significant bias for pill, condom, and using no method. Consequently, we report results for the fixed-effects estimator for these methods of contraception. The tests indicate that unobserved heterogeneity does not introduce bias for diaphragm, Norplant, and injectables. For this reason, we report results from the random-effects estimator for these methods. The lack of such evidence for diaphragm, Norplant, and injectables is probably due, in part, to the much smaller samples for analyses of these method types (a person had to report knowing of the method to report their ratings about the method). Further, these methods are viable options for relatively few couples (based on reported use of these methods), and consequently these methods may be discussed by far fewer couples (one possible source of unobserved heterogeneity). In each case, the Hausman tests yielded probability values in excess of .52, and none of the individual parameters obtained from the two approaches are significantly different from each other. Due to the greater efficiency of the random-effects estimator, more terms are statistically significant for this estimator than the fixed-effects estimator.

The figures in Table 2 show that higher pregnancy prevention ratings are associated with a higher overall assessment of the condom, diaphragm, and no method, with the returns especially large for the condom. Surprisingly, pregnancy prevention ratings are not associated with the overall rating of the pill, Norplant, or injectables. An examination of the raw data revealed that nearly everyone rated these methods highly for pregnancy prevention, and the lack of significant findings for these methods is probably due to a lack of sufficient variance in

responses to permit estimating the marginal effect of small changes in ratings. STD protection ratings are not significantly associated with the overall rating of any method, including the condom.

A method's ratings on how it affects a woman's ability to get pregnant within a year after stopping method use is significantly positively associated with a higher preference rating for all methods except diaphragm, although the point estimate is in the predicted direction. The effect is especially large for the pill (.175). Expected partner approval of the method is statistically significant for the Diaphragm (at the p=.10 level), Norplant, and injectables, with an especially large effect for Norplant. Surprisingly, expected partner approval is unrelated to the preference rating of the condom. A higher rating on the likelihood of experiencing serious health issues is positively associated with the preference rating of the pill, Norplant, and injectables, with a very large mariginal effect for injectables. Minor health issues like weight gain are not related to method preference ratings for any method type.

Note that the higher a method is rated on the need for partner cooperation to use it, the lower its method preference rating. Since two of these relationships (for the pill and diaphragm) are significant at the p=.10 level, this finding provides some limited evidence that married and cohabiting men and women view the need for partner cooperation as a positive trait. Ratings of methods on the need to plan have little impact on method preference ratings, with this factor attaining significance for only the pill. Higher ratings for interference with pleasure are positively associated with the preference ratings of the condom, diaphragm, and (especially) injectables. Greater time to learn the method is associated with lower overall ratings for the condom and the diaphragm.

In an unexpected finding, higher start-up costs are significantly related to preference rating only for the pill. In addition, the point estimate for the pill indicates that those who estimated higher costs to adopting that method gave it a higher preference rating. This suggests that those view the pill as a good option probably have a more accurate assessment

of its adoption costs. Turning to the monthly costs of continuing use we find that these costs are also positively related to the preference rating of the diaphragm, a somewhat counter-intuitive finding. In contrast, higher monthly costs are related to a lower preference rating for the condom.

Note that the preference rating of every method is positively related to their rating on ease of use. However, on all other dimensions there appears to be differences between the barrier and hormonal methods. The preference for the condom and diaphragm are both significantly related to ratings on pregnancy protection, time need to learn to use, interference with sexual pleasure and monthly cost (although the effects of cost are in opposite directions). Note, however, the ability to get pregnant after stopping use is important only for the condom's preference rating. Among the hormonal methods, in contrast, the ability to get pregnant within a year of stopping use is an important factor for all methods. So too are their ratings on serious health effects and (as noted above) ease of use. However, these three methods also differ on some key dimensions. Note in particular that partner approval is significantly positively related to preference ratings only for implants and injectables and interference with sexual pleasure is a significant factor the injectables alone. In comparison, ratings on the need to plan ahead and cost are significant for the pill. The relationship between gender and the preference rating of each method is also interesting. Men rate implants and injectables significantly higher than women. They also rate the condom and no method somewhat higher than women, but these differences are significant only at the p=.10 level.

Importance Weighted Expectancy Ratings

In the next stage of the analyses, we examined whether reporting that a dimension of use was important in selecting a method of contraception altered (made more salient) the effect of one's rating of a method along that dimension, and whether the effects on method preferences of these ratings varied by gender. The addition of the importance weighted expectancy ratings significantly improved model fit for pill, condom, and use of no method.

Significant gender differences were also found for these three methods. The lack of significant effects for importance weighted ratings and gender interactions for diaphragm, Norplant, and injectables may be due, in part, to the smaller sample sizes available for analyzing these methods. As more terms were added to models of these methods, the estimated standard errors grew quite large.

Results for the expanded fixed-effects model of the preference rating of the pill are shown in Table 3. The coefficients shown are total effects. Thus the results in the first and third columns show the effects of expectancy ratings, for women and men respectively, among those who did not identify the dimension as being "important" or "very important:" when selecting a method. The effects of those who did say the dimension was important are shown in columns 2 and 4.

[Table 3 about here]

One result is immediately obvious when examining Table 3. Contrary to our expectations, there is relatively little support for the hypothesis that the effects of expectancy ratings are larger for those who define a dimension as important. Although the point estimates for seven dimensions for women and six dimensions for men are consistent with the hypothesis, the differences are substantive for only three of the dimensions for women (ease of use, interference with pleasure, and cost to continue) and one dimension for men (ease of use). Moreover, the direction of change is in the wrong direction for women along six dimensions, one of which is quite large (cost to adopt), and for seven dimensions for men. In fact, only the results for ease of use support the hypothesis for both men and women.

A few ratings are strongly, positively related to preference ratings for all groups. For instance, the effects of the pill's rating on the ability to get pregnant after stopping use is strongly, positively related to preference ratings for all groups. This same pattern is found for the need to plan ahead, but the effects are stronger among men. In contrast, the positive effects of the method's ratings on ease of use are found only among those who rate this dimension as

important. An unexpected finding is that the pill's ratings on lack of interference with sexual please are significantly negatively related to its preference ratings among women who say that this dimension is unimportant. This relationship is positive among women who think it is important but the point estimates are also negative among both groups of men. Another unexpected finding is that women who report that the costs to continue use are important give the pill higher ratings as those estimated costs increase. In addition to larger effects for males than females in the influence of ratings of the pill for needing to plan ahead, there are few other noticeable gender differences. Women who report that the costs to continue is important rate the pill lower, relative to men, as those costs rise.

Results from the expanded model of condom ratings are shown in Table 4. Similar to the results in Table 3, these results fail to provide much support for the hypothesis that expectancy ratings on dimensions identified as important have more influence on the preference ratings of a method. Overall, the differences are in the predicted direction for women along five dimensions and for six dimensions for men. Substantive differences that follow this pattern are found only for pregnancy protection, with pill ratings on this dimension significantly, positively related to the preference ratings of both men and women who identify this dimension as important. For six dimensions the differences are opposite to those predicted, with large differences for cooperation needed to use, and for five dimensions for men, with larger differences for cost to continue use.

[Table 4 about here]

The results in Table 4 also provide evidence of gender differences in the influence of the condoms ratings on ability to get pregnant later, ease of use, lack of interference with pleasure, start up costs, and monthly continuation costs. Ratings of the condom on its effects on future fertility are clearly more strongly positively related to preference ratings among women that among men, and there is little difference by whether the dimension is considered an important selection criterion. In contrast the significant effects of ratings of the condom on ease of use,

interference with sexual pleasure and the two cost factors are found only among men, primarily among those who do not rate these factors as important. Surprisingly, estimated adoption costs are strongly positively related to the preference ratings of men who say they are unimportant. Costs to continue, however, are negatively related to the preference ratings of these men. There is also some evidence that this dimension of use has a somewhat greater overall impact on the preference rating for women compared to men.

Results from the expanded no method model are shown in Table 5. These results indicate that women's expectations about the likelihood of pregnancy while using no method strongly affect their preference rating of no method, at least if they indicate that risk of pregnancy is not an important factor in assessing methods of contraception. For men, regardless of whether or not they indicate that risk of pregnancy is important, rate the use of no method higher the lower their expectation of the risk of pregnancy while using no method. Ratings for the likelihood of acquiring an STD while using no method are not strongly related to the rating of no method for either women or men.

Discussion

The results of this analysis show that the various dimensions on which methods are evaluated differ in their importance in the method selection process. Pregnancy protection is the most important dimension and it is followed by major and minor health consequences. Partner approval, ease of use and interference with sexual pleasure are also rated as important or very important by about three-quarters of respondents.

It is also critical that method expectancy ratings on these dimensions have differential effects on preferences for different method types. As an example, although pregnancy protection is clearly the most important selection criterion, method expectancy ratings on this dimension have significant effects on preference rating for only the condom, diaphragm and no method. This result suggests that there is probably a high level of

consensus that the hormonal method types are highly effective in preventing pregnancy. This would tend to reduce the variance in these expectancy ratings, making them poor predictors of preference ratings for these method types. This same pattern is found for interference with sexual pleasure, the ratings on which are not critical determinants of preference ratings for these coitus-independent methods (except for injectables). In contrast, expectancies about major health consequences to use of a method are important determinants of preferences for these methods since there is little consensus about the likelihood of suffering such consequences. Interestingly, method expectancies with respect to ease of use are important for all method, even the coitus independent method types.

Another fact that is worth considering is that even though such factors as expectancies regarding pregnancy protection have no significant effect on the preference for certain method types, this does not mean that this factor is unimportant in the choice of those methods from among a larger choice set. Clearly, the choice between the pill and condom, for example, is likely to be influenced by this factor since condom preference ratings are highly dependent on expectancies regarding this factor. However, choices among the set of highly effective methods are probably not determined by effectiveness ratings.

The next step in our analysis was to define what are generally called importance-weighted expectancy ratings and investigate their relationships with method preference ratings. In general, such weighted ratings are created as the product of two ordinal scales, one measuring the importance or value of a consequence to use, and the other defining the expectancy or likelihood that the consequence will occur. However, we have concerns about the meaning of resultant scale since a single value on the weighted scale can be the result of multiple combinations of values on each component (e.g., an importance score of 1 and an expectancy score of 5 will yield the same product as an importance score of 5 and

an expectancy score of 1). In our analysis, we have an ordinal importance measure (1=very unimportant to 5=very important) but a continuous expectancy measure (0% to 100%), but the same problem exists in interpreting the product of these two measures. Thus, we decided to dichotomize the importance variable (1=important or very important, 0=else) and interact it with the expectancy rating. In this way we can show the effects of expectancy ratings for those who do and do not think the factor in important in making method choices. We also defined a gender interaction to investigate gender differences in these effects

As a set, these interactions were statistically significant for the pill, condom and no method. However, the effects we found are not easily interpretable. We expected that women and men would differ on what consequences to use affected their preference ratings but although the gender interaction is statistically significant, clear patterns emerge only for the condom. For the condom, method ratings on pregnancy protection and subsequent fertility tend to have larger effects on the preferences of women compared to men. The opposite tended to be true for ease of use, sexual pleasure and costs to adopt and use.

We also expected that the expectancy ratings of those who define a dimension of use as important would have a greater impact on preference scores than those who defined it as less important. However, in general we find limited support for this conclusion. On most dimensions for all three method types we consider, the ratings of those who did not identify the dimension as important had effects on preference ratings that were often of the same general magnitude as those who said they were important, while a few were smaller and a few were even larger than those who said they were important. Again, this may be the result of differential variance on the expectancy measures. It may be that those who define a consequence to use as important have learned more about the methods in their choice set with respect to those factors. Thus, they would provide more consistent

evaluations than those who define them as unimportant and know less about them as a result. There is some evidence in support of this argument.

Put into the context of other research on gender differences in the method selection process, this study yields similar conclusions. When we investigated how gender was related to the formation of values and expectancies, we found that differences do exit, but that the results are characterized more by their similarities than their differences (Grady et al. 1999). When we examined how partner concordance in the method each identified as most preferred (based on their preference ratings), we also found more similarities than differences (Rutter et al. 2007). In this paper we look at how values and expectancies are related to those preference ratings and once again, the gender differences we find are statistically significant, but not large and consistent. We also tried alternative models in search of gender differences, including gender interactions with the overall expectancy ratings (not weighted) and with the importance variable and found no significant differences by gender. However, this line of investigation should continue in pursuit of a better understanding of the role of gender the formation of method preferences and in how they are used in the selecting methods. We also need to develop a better understanding of why the expectancy ratings of those who define a dimension of use as important tend to have little impact on their method preference ratings.

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Table 1: Average Preference Ratings of Different Methods by Gender, Expectancy Rating of Methods on Different Dimensions of Use, and Overall Importance of Each Dimension when Choosing a Method (Utility).

	Contraceptive Method Type						% Saying Dimension Important
	Pill	Condom	Diaphragm	Norplant	Injectable	No method	
Preference Ratings							
Overall	66.0	64.5	47.0	50.7	55.6	27.5	
Female	63.8	63.5	45.6	48.5	53.5	25.9	
Male	68.4	65.6	48.6	54.0	58.7	29.1	
Expectancy Ratings							
Pregnancy Protection	84.3	78.5	78.8	87.0	82.2	26.3	85.2
STD Protection	86.6	92.0	84.6	80.3	78.7	80.8	53.6
Able to Get Pregnant after Stopping	69.5	77.8	79.8	59.4	61.0	---	61.5
Partner Approval	80.7	71.7	60.4	56.5	65.5	---	77.2
Not Have Serious Health Effects	79.3	---	---	70.5	69.3	---	83.5
Not Have Minor Health Effects	37.3	---	---	48.2	38.9	---	79.5
Cooperation Needed to Use	79.9	45.7	55.9	71.0	74.7	---	35.0
Ease of Use	84.1	75.5	42.1	69.5	74.9	---	76.0
Need to Plan Ahead	87.6	77.7	52.2	87.5	86.5	---	63.4
Not Interfere with Sexual Pleasure	88.8	42.0	57.4	89.9	89.2	---	74.5
Not Take Extra Time to Learn	38.0	4.2	27.3	---	---	---	49.7
How Much it Costs to Adopt	$62.1	$12.1	$65.5	$120.6	$86.2	---	49.4
How Much it Costs to Continue	$26.7	$15.0	$21.0	$32.8	$35.8	---	50.7
N	1172	1239	883	638	823	1329	

Table 2: Coefficients from Regression Model of Preference Ratings that Includes Method Expectancy Ratings, Gender and Control Variables.

Dimension of Use and Gender	Method Type					
	Pill [a]	Condom [a]	Diaphragm [b]	Norplant [b]	Injectable [b]	No Method [a]
Pregnancy Protection	0.021	0.138**	0.089**	0.017	-0.031	0.071*
STD Protection	-0.035	0.056	-0.030	-0.055	-0.018	0.034
Able to Get Pregnant after Stopping	0.175**	0.104**	0.051	0.110**	0.113**	---
Partner Approval	-0.033	-0.007	0.048*	0.157**	0.082**	---
Not Have Serious Health Effects	0.099**	---	---	0.094*	0.214**	---
Not Have Minor Health Effects	0.012	---	---	0.053	0.037	---
Cooperation Needed to Use	-0.050*	-0.030	-0.051*	-0.028	-0.029	---
Ease of Use	0.097**	0.072**	0.134**	0.094**	0.151**	---
Need to Plan Ahead	0.136**	0.023	0.015	-0.081	-0.054	---
Not Interfere with Sexual Pleasure	-0.044	0.048**	0.078**	0.085	0.122**	---
Not Take Extra Time to Learn	-0.022	-0.049*	-0.019**	---	---	---
How Much it Costs to Adopt	0.034**	0.039	0.006	-0.004	-0.008	---
How Much it Costs to Continue	0.001	-0.135**	0.077**	0.004	0.025	---
Male	2.1	2.9*	1.1	9.2**	4.7**	3.6*
N	1013	1136	678	509	652	1232

* Significant at the .10 level ** Significant at the .05 level

[a] Estimates from the fixed-effects model [b] Estimates from the random-effects model

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Table 3: Coefficients from Fixed Effects Regression Model of Preference Ratings for the Pill that Includes Weighted Method Expectancy Ratings, Gender and Control Variables.

Dimension of Use	Female		Male	
	Dimension Not Important	Dimension Important	Dimension Not Important	Dimension Important
Pregnancy Protection	-0.046	0.020	0.013	0.050
STD Protection	-0.000	0.020	-0.025	-0.060
Able to Get Pregnant after Stopping	0.199**	0.161**	0.221**	0.156**
Partner Approval	-0.034	-0.058	-0.006	-0.020
Not Have Serious Health Effects	0.106	0.026	0.061	0.063
Not Have Minor Health Effects	-0.046	0.006	0.018	-0.026
Cooperation Needed to Use	0.008	-0.003	-0.073	-0.070
Ease of Use	0.065	0.133**	0.066	0.111*
Need to Plan Ahead	0.113**	0.105*	0.158**	0.169**
Not Interfere with Sexual Pleasure	-0.140**	0.077	-0.024	-0.055
Not Take Extra Time to Learn	0.022	-0.021	0.011	0.005
How Much it Costs to Adopt	0.005	0.080**	0.050	0.001
How Much it Costs to Continue	0.121	-0.117	-0.103	0.003

* Significant at the .10 level ** Significant at the .05 level

Table 4: Coefficients from Fixed Effects Regression Model of Preference Ratings for the Condom that Includes Weighted Method Expectancy Ratings, Gender and Control Variables.

Dimension of Use	Female		Male	
	Dimension Not Important	Dimension Important	Dimension Not Important	Dimension Important
Pregnancy Protection	0.122	0.174**	0.038	0.156**
STD Protection	0.041	0.084	-0.000	0.023
Able to Get Pregnant after Stopping	0.148**	0.140**	0.074	0.047
Partner Approval	-0.062	0.014	-0.055	0.046
Not Have Serious Health Effects	---	---	---	---
Not Have Minor Health Effects	---	---	---	---
Cooperation Needed to Use	-0.027	-0.082*	-0.033	-0.001
Ease of Use	0.079	0.053	0.092*	0.084**
Need to Plan Ahead	0.007	-0.006	0.003	0.044
Not Interfere with Sexual Pleasure	0.015	0.061	0.105*	0.016
Not Take Extra Time to Learn	-0.045	0.025	-0.065	-0.034
How Much it Costs to Adopt	-0.121	-0.055	0.204**	-0.007
How Much it Costs to Continue	0.002	-0.038	-0.267**	-0.103

* Significant at the .10 level ** Significant at the .05 level

Table 5: Coefficients from Fixed Effects Regression Model of Preference Ratings for No Method that Includes Weighted Method Expectancy Ratings, Gender and Control Variables.

Dimension of Use	Female		Male	
	Dimension Not Important	Dimension Important	Dimension Not Important	Dimension Important
Pregnancy Protection	0.178**	0.014	0.125*	0.090*
STD Protection	-0.006	0.048	0.034	0.055

* Significant at the .10 level ** Significant at the .05 level