

Women's Acceptance of the Diaphragm: The Role of Relationship Factors

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The vaginal diaphragm is a candidate for a female-controlled method that could reduce risk of HIV/STI acquisition. We examined the association between relationship and partner factors and three measures of diaphragm acceptability: current use, consistency of use, and satisfaction with use. We conducted a telephone survey with 448 female members of a managed care organization, aged 18-49, who currently used contraception (including 140 diaphragm users, 187 pill users, and 121 male condom users). Use of a specific contraceptive was significantly associated with relationship length, condom-use negotiation self-efficacy, importance of covert use, perceived motivation of partner to prevent HIV/STIs, and perceived satisfaction of partner with current method. In addition, among diaphragm users, communication about HIV/STIs and perceived partner motivation to use a diaphragm were related to consistent use. These results suggest that acceptability of contraceptive methods among women is influenced by their perceptions of their male partner and relationship factors.

The development of methods for prevention of HIV and other sexually transmitted infections (STIs) that are primarily under female control is a public health priority (Cohen, 2002; Gollub, 1999). The male latex condom, currently the most effective method for prevention of HIV and STIs (Stone, Timyan, & Thomas, 1999), requires male participation and cooperation. Even though women may desire to use condoms, their male partners may be unwilling, and, because of gender-based power imbalances and other cultural factors, some women may be unable or unwilling to negotiate male condom use (Amaro, 1995; Amaro & Raj, 2000; Blanc, 2001; Wingood & DiClemente, 2000). Therefore, women need methods that they can use without their male partners' knowledge.

The diaphragm, an internal mechanical barrier that provides physical protection of the cervix, is a viable candidate for a female-controlled method that could reduce the risk of HIV/STI acquisition for several reasons (Cohen, 2002; Diaphragm Renaissance, 2002; Harvey, Bird, & Branch, 2003; Moench, Chipato, & Padian, 2001). First,

findings from several observational studies suggest that the diaphragm used with spermicide is effective in decreasing infection from bacterial STIs, mainly gonorrhea, and associated long-term sequelae (Austin, Louv, & Alexander, 1984; Magder, Harrison, Ehret, Anderson, & Judson, 1988; Rosenberg, Davidson, Chen, Judson, & Douglas, 1992). This protective effect is important because untreated STIs can increase the sexual transmission of HIV (Eng & Butler, 1997; Moss et al., 1995). Second, the diaphragm is safe, relatively inexpensive, has limited side effects, does not interfere with natural hormones, and can be used without the male partner's knowledge. Third, the diaphragm is approved by the FDA for contraceptive use and is currently available to American women. Unfortunately, chemical barrier methods (i.e., microbicides) that women can use to protect themselves from HIV and other STIs are not currently available. It may be several years before microbicides or other methods under development come on the market (Cohen, 2002; Gollub, 1999). Consequently, investigating the acceptability and efficacy of existing contraceptive methods that could potentially protect against HIV and other STIs is essential (Stein, 1993, 1995; Stein & Susser, 1998). Finally, the diaphragm could also serve as a physical barrier to hold in place microbicides if and when they become available.

Diaphragms are used by only 2% of current contraceptive users (aged 15-44; Piccinino & Mosher, 1998). Despite the diaphragm's lack of popularity, women currently using it find it highly acceptable, as indicated by high satisfaction ratings (Maher, Harvey, Bird, Stevens, &

Note. This research was supported by Grant Number 5R01 HD40137 from the National Institute of Child Health and Human Development to S. Marie Harvey. We thank the following individuals for their contributions to the study: Nancy Padian, Shannon Fulmer, Alan Bauck, Karen Riedlinger, Cheryl Johnson, Cherry Johnson, Andrea Brown, Kennitha Burks, Amanda Petrik, Maile Thiesen, Eleanor Brown, Meredith Roberts Branch, and Winnie Louie. We also acknowledge the Kaiser Permanente Center for Health Research for the development and maintenance of their data systems.

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Beckman, 2004). Given the growing attention focused on the diaphragm and similar products in development, it is critical that we understand the factors that contribute to the acceptability of this method. No matter how effective such methods are, they will only be used if women find them acceptable. To our knowledge, outside of our own work (Bird, Harvey, Maher, & Beckman, 2004; Harvey, Bird, Maher, & Beckman, 2003; Maher et al., 2004) and a study comparing the acceptability of the diaphragm and FemCap, a new vaginal barrier method (Mauck, Callahan, Weiner, Dominik, & FemCap Investigators Group, 1999), only a few studies in other countries have examined the acceptability of the diaphragm (e.g., Bulut et al., 2001; Di Giacomo, Barbosa, Kalckmann, Villela, & Gohiman, 1995; Ortayli, Bulut, Nalbant, & Cottingham, 2000; Ravindran & Rao, 1997).

Because sexual intercourse is an interdependent behavior (Agnew, 1999), acceptability is likely influenced by characteristics of the dyadic relationship and perceptions about one's partner's motives and attitudes. Although women can usually use the diaphragm without their partner's knowledge, its use is still likely to be influenced by the situational context of the sexual relationship. Especially in relationships with a main partner, the woman's perception of the relationship, her interaction with her partner, and her partner's attitudes and beliefs about the diaphragm are likely to influence her willingness to use it. Covert use of a contraceptive or HIV preventive method may be a difficult decision for women. Use of a method may involve going against the partner's wishes (Blanc, 2001) and challenging social norms about trust in primary relationships (Koo, Woodsong, Dalberth, Viswanathan, & Simons-Rudolph, 2005). In addition, women may have fears about their partner's discovery of the method and its effect on the relationship (Blanc; Koo et al.).

Previous research examining correlates of diaphragm acceptability has focused on intrapersonal characteristics such as sexual and reproductive history, diaphragm characteristics, and personal motivation (e.g., Bird et al., 2004; Bulut et al., 2001; Di Giacomo et al., 1995; Harvey, Bird, Maher, et al., 2003; Maher et al., 2004; Ravindran & Rao, 1997). Research also has examined reasons for not using the diaphragm and barriers to use (Harvey, Bird, & Branch, 2003; Harvey, Bird, Maher, et al., 2003; Maher et al., 2004). Partner influences and relationship characteristics have rarely been explored. One exception is the Bulut et al. intervention conducted in the Philippines, Turkey and Columbia. Results from this study indicated that diaphragm acceptors, as compared to acceptors of other methods, placed greater importance on user control such that partner approval or cooperation are not needed. Two other studies conducted in Turkey and Brazil suggest that partner views are positively related to acceptability of the diaphragm (Di Giacomo et al.; Ortayli et al., 2000).

In contrast to the lack of research on the association of relationship and partner variables to diaphragm use, studies have examined the influence of a variety of these fac-

tors on use of other barrier methods. For example, previous research has explored the association of male condom use to relationship structure (e.g., Civic, 1999; Harvey, Bird, Galavotti, Duncan, & Greenberg, 2002), power and decision-making dynamics (e.g., Harvey et al., 2002; Pulerwitz, Amaro, DeJong, Gortmaker, & Rudd, 2002; Pulerwitz, Gortmaker, & DeJong, 2000; Soet, Dudley, & DiIorio, 1999; Soler et al., 2000), and partner views about condoms (e.g., Cabral, Pulley, Artz, Brill, & Macaluso, 1998; Gómez & Marín, 1996). Two studies found that partner and relationship factors may have more explanatory power than intrapersonal factors in predicting condom use (Harlow, Quina, Morokoff, Rose, & Grimley, 1993; Soet & Dilorio, 1998).

Relationship and partner variables have also been associated with the acceptability of the female condom. Type of relationship (Choi, Roberts, Gomez & Grinstead, 1999; Macaluso, Demand, Artz, & Hook, 2000), perceived partner preferences (Choi, Gregorich, Anderson, Grinstead, & Gomez, 2003; Choi et al., 1999; Hoffman, Exner, Leu, Erhardt, & Stein, 2003), and unequal power in a relationship (Cabral et al., 1999) have been related to use and acceptability of the female condom. Moreover, women's attitudes toward barrier methods have been related to concerns about trust (Cabral et al., 1999), and for some women, one of the valued features of the female condom is the lack of a need to negotiate with the male partner (Gollub, Stein, & El-Sadr, 1995). Taken together, this research suggests that relationship and partner factors may be crucial determinants of the use of barrier methods, including the diaphragm. As Harvey (2000) noted, we need female-controlled prevention methods that are acceptable to women and additional information on the influence of the male partner and relationship dynamics on women's motivations and behaviors with regard to HIV/STI prevention.

Selection of relationship and partner variables in the present study was based on the empirical literature and theoretical concerns. There are no comprehensive theoretical models to guide this type of research, and little is known about some of the constructs as applied to acceptability of birth control or STI methods. However, Connell's theory of gender and power provides a description of the three gendered social structures that explain gender relationships: division of labor, division of power, and social norms/affective relationships. Connell contended that social structures and mechanisms create gender-based disparities in control of resources and expectations (Connell, 1987; Wingood & DiClemente, 2000). In this study, we included several variables that relate to one of Connell's structures, the sexual division of power. We used a broad conceptual framework in which women's perceptions of the characteristics and qualities of their partner-specific relationships (e.g., relationship communication; relationship power; perceived importance of partner's views) and their perceptions of their partner's characteristics (e.g., perceived partner satisfaction with birth control

method; perceived partner motivation to avoid STIs) are categorized as relationship and partner factors that may influence diaphragm acceptability.

Our research provides information about the acceptability of the diaphragm among diverse groups of women in the U.S. In this article, we examined the association between interpersonal (relationship and partner) factors and acceptability of the diaphragm. To strengthen the validity of our results, we examined three different forms of diaphragm acceptability: current use (as compared to use of other methods); consistency of use; and satisfaction with use. Our objectives were (a) to examine how women who use the diaphragm differ from women using the pill or the condom on relationship and partner factors thought to influence contraceptive acceptability; and (b) to explore associations between relationship and partner characteristics and both satisfaction and consistency of use among current diaphragm users. To our knowledge, this is the first study with the primary purpose of investigating these relationships. Such information is essential for understanding who might use the diaphragm as a method of disease prevention, if it were found to be effective in preventing HIV.

METHOD

Participants and Procedure

As previously described (Harvey, Bird, Maher, et al., 2003), we selected potential participants from Kaiser Permanente Northwest (KPNW) members. KPNW, a nonprofit health maintenance organization (HMO), provides medical care to over 450,000 members in northwest Oregon and southwest Washington. Using existing administrative databases, we identified women aged 18 to 50 years old who were enrolled as KPNW members for at least one month in the previous 2.5 years. We used the KPNW database on pharmacy dispensings to determine which of these women received a diaphragm in the previous 2.5 years. For our sample, we selected all 958 women aged 18 to 50 years old who had received a diaphragm from KPNW (and for whom address information was available) and a random sample of 3,589 women in the same age range who had not obtained a diaphragm from KPNW (and for whom address information was available). Letters were sent to both groups of women inviting them to participate in the study.

Approximately one week after letters were sent, interviewers began calling potential participants and screening them for interest and eligibility. To be eligible, women had to report either (a) having used a diaphragm during the past 2.5 years or (b) having used a different contraceptive method during the past 3 months (excluding sterilization, abstinence, douching, or withdrawal) and never having used a diaphragm. A woman was ineligible if she did not understand and feel comfortable speaking English; was less than 18 years old or over 50 years old; had not had vaginal sex with male partner in past 3 months; had tested positive for HIV; or was currently pregnant, trying to get pregnant, or suspected she was pregnant.

Interviewers screened 2,717 (60%) of the 4,547 women originally selected for the sample. The 1,830 women not screened included 29 who were identified as needing interpretive services, 13 for whom no valid address could be found, 236 for whom no valid telephone number could be found, 9 who could not be contacted after at least 20 attempts, 28 who could not be reached based on information from a family or household member, 1,125 whom we were still attempting to contact at the termination of data collection, and 390 for whom we had a wrong number that still needed to be traced. Of those screened for interest and eligibility, 571 (21%) refused participation (in all but two cases before eligibility was determined), and 1,381 (51%) were ineligible. The remaining 765 women participated in the study. The final sample included 387 current and former diaphragm users (215 current and 172 former) and 378 women who used other contraceptive methods in past 3 months but who had never used the diaphragm.

Between July 2001 and March 2002, respondents each participated in a 30-minute telephone interview. All study interviewers were female staff members at the Kaiser Permanente Center for Health Research in Portland, Oregon. The interviews were conducted using a computer-assisted telephone interviewing (CATI) system. A \$25 gift certificate was mailed to participants for their time and effort. The institutional review boards of the University of Oregon and the Kaiser Permanente Center for Health Research approved this research.

For the present analyses, the sample ($N = 448$) was limited to women who were current (i.e., in the past 3 months) diaphragm users ($n = 140$), pill users ($n = 187$) or condom users ($n = 121$). We examined pill users because the pill is an effective contraceptive method, but not an effective disease-prevention method. Condom users were included because condoms are the foundation of HIV prevention, are a barrier method, and have the potential to provide protection from both pregnancy and disease if used correctly and consistently.

Women who reported currently using more than one effective contraception method were excluded from these analyses (for example, a woman who reported using both the diaphragm and the condom in the past 3 months was excluded). All 3 groups included small numbers of women who also reported currently using low-effectiveness method(s) such as withdrawal and rhythm (15 diaphragm-only users, 4 pill-only users, and 17 condom-only users).

Measures

The measures used in our analysis are described below. As indicated below, we dichotomized several variables measured on five-point Likert scales because their distributions were skewed.

Acceptability of the diaphragm. Our measures of acceptability included current use of the diaphragm (as compared to current pill and condom use), consistency of diaphragm use, and satisfaction with the diaphragm. Current diaphragm

users were asked if in the past 3 months (or since they started using the diaphragm, if they had started using it only within the past 3 months), they had vaginal sex without using the diaphragm even once. If they responded “no,” we categorized them as consistent diaphragm users; if they responded “yes,” we categorized them as inconsistent users. We also asked current diaphragm users how satisfied or dissatisfied, on a five-point scale ranging from 1 (*extremely dissatisfied*) to 5 (*extremely satisfied*), they were with the diaphragm as a birth-control method. Because this distribution was highly skewed and we were primarily interested in the distinction between those satisfied and those not satisfied, we dichotomized scores into satisfied (*somewhat satisfied* or *extremely satisfied*) or not satisfied (*neither dissatisfied nor satisfied*, *somewhat dissatisfied*, or *extremely dissatisfied*).

Demographic, sexual, and contraceptive behavior. The interview guide contained questions concerning participants’ demographic characteristics and sexual behaviors. In addition, participants were asked several questions to assess current and past use of contraceptive methods.

Relationship stability. Participants were asked how long they had been in a sexual relationship with their main partner (like a boyfriend, husband or lover). Also, marital status, although a sociodemographic variable, was conceptualized as a measure of relationship stability.

Control and decision-making. We asked women about two dimensions of relationship power, control and decision-making. We assessed control using 15 items, each rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*), adapted from the Control subscale of the Pulerwitz et al. (2000) Relationship Power Scale. For example, women indicated their agreement with the statements “Most of the time we do what my partner wants to do” and “When my partner and I disagree he gets his way most of the time.” Responses were reverse-coded, and we averaged the scores over the 15 items ($\alpha = .76$). A higher score on the scale indicates greater perceived relationship control for the woman.

In addition, we assessed pregnancy-specific decision-making with two items that asked, “Who usually has more say about whether you use something to keep from getting pregnant?” and “Who usually has more say about what you use to keep from getting pregnant?” Each item was rated on a five-point scale from 1 (*you always do*) to 5 (*your partner always does*). The responses were reverse-coded, and we created a combined measure of pregnancy decision-making power by averaging the two items ($\alpha = .65$). A higher score on the scale indicates that participants perceived themselves as having more say.

Relationship communication. We asked women if they had ever talked with their partner about three topics: what type of birth control they both would like to use, how they both feel about using the diaphragm, and how to protect themselves against HIV and other STDs. Each question was answered *Yes* or *No*.

Self-efficacy for condom-use negotiation. A scale consisting of 5 items was adapted from the 15-item condom self-

efficacy scale developed by Brafford and Beck (1991). The items assessed how confident women were in negotiating various aspects of condom use with their partners. For example, women were asked how confident they were that they could discuss using condoms with their partner and how confident they were that they could suggest using condoms to their partner, even if they were afraid he would think they were having sex with another man. Each item was rated on a five-point scale from 1 (*not at all confident*) to 5 (*extremely confident*). A mean score on the entire scale was computed, with higher scores on the scale indicating greater self-efficacy for condom use negotiation ($\alpha = .87$).

Partner’s motivation to avoid pregnancy, HIV, and other STIs. To measure perceptions of partner’s motivation, we asked participants three questions regarding how important on a five-point scale, from 1 (*not at all important*) to 5 (*extremely important*), it is to their partners to (a) keep them from getting pregnant now, (b) do something now to keep from getting infected with HIV when they have sex, and (c) do something now to keep from getting infected with an STD other than HIV when they have sex. Based on the skewed response distribution, we dichotomized motivation to avoid pregnancy into *extremely important* versus *all other responses*. By averaging the scores for the last two items, we created a combined measure of motivation to avoid HIV/STIs ($\alpha = 0.98$) for current diaphragm users. Based on the skewed response distribution, we dichotomized mean scores on this measure such that scores equal to 1 were categorized as “no motivation” (*not at all important*) and scores greater than 1 were categorized as *some motivation*.

Partner satisfaction. A single item assessed perceived partner satisfaction with current birth control method. We used a five-point scale that ranged from 1 (*extremely dissatisfied*) to 5 (*extremely satisfied*). We dichotomized this measure such that scores equal to 5 were categorized as *extremely satisfied* and scores less than 5 were categorized as *less than extremely satisfied*.

Importance of partner’s views and covert use of birth control. We measured partner norms by asking women, when selecting a birth control method, how important it was to them that it be “a method your partner likes.” The five-point importance scale ranged from 1 (*not at all important*) to 5 (*extremely important*). Based on distribution characteristics, we dichotomized responses into *high importance* (i.e., *very important* or *extremely important*) and *low importance*. Using the same scale, we also asked women how important it was that a birth control method could be used without the male partner’s knowledge. Based on the response distribution, we dichotomized responses into *no importance* (i.e., *not at all important*) and *some importance*.

Diaphragm-specific characteristics. Current diaphragm users were asked how much they agreed that “the diaphragm could be used without your partner knowing” (answered on a five-point agreement scale) and “how important is it to your partner to use a diaphragm?”

(answered on a five-point importance scale). Based on the response distribution, we created a dichotomous measure by combining somewhat and strongly agree into *agree* and all other responses into *do not agree*. On the second measure, responses were categorized into *extremely important* versus *all other responses*.

Analysis

We conducted bivariate analyses to compare diaphragm users with condom and pill users on background characteristics, relationship stability, power and communication, self-efficacy for condom use negotiation, perceptions of partner's motivation and satisfaction, perceived importance of partner's views, and surreptitious method use. For these analyses, the statistical significance of group differences was assessed using the Pearson chi-square test for categorical variables, Kruskal-Wallis test for ordinal variables, and independent *t*-test or one-way analysis of variance for continuous variables. We then performed multinomial logistic regression to analyze the adjusted association between these characteristics and the method used. In this analysis, we calculated the odds of being a diaphragm user compared with being a pill user or a condom user. Interpersonal (relationship and partner) variables with a corresponding *p*-value of $< .05$ in bivariate analyses were included as independent variables in the model. Age and education also were included as control variables because they were believed to be the most important potential confounders. Other demographic variables previously have been examined in other analyses of this data set (Bird et al., 2004; Harvey, Bird, Maher, et al., 2003; Maher et al., 2004).

We used a similar approach for the analyses among current diaphragm users. We conducted bivariate analyses to compare consistent versus inconsistent diaphragm users and satisfied versus non-satisfied diaphragm users. Then, using similar criteria for inclusion of independent variables as in our previous analysis, we conducted multiple logistic regression to estimate adjusted associations between relationship variables and consistency of use. Education was not included in this model because it was not significantly associated with consistency of use in the bivariate analysis. We chose not to conduct a multiple logistic regression analysis for satisfaction because of the small number of participants in the non-satisfied group ($n = 25$).

RESULTS

Characteristics of the Sample

The participants averaged 32.60 years of age ($SD = 8.28$; range = 18-49). Most (85.2%) were non-Hispanic White. Participants were relatively well-educated: 50.2% were college graduates and another 27.9% had some college training. Most (72.1%) were employed outside of the home. Sixty-eight percent were married; all of the women, whether married or unmarried, reported that they were involved in a relationship with a main partner. Over two thirds of the women (68.2%) had at least one child.

The women were at relatively low risk for HIV and other STIs. Less than 1% reported having more than one male sex partner in the last three months, and 6% reported more than one partner in the last 12 months. Fifteen women (3.3%) reported sharing needles or having had an STD in the last 12 months; a similar percentage (3.4%) stated that in this time period, they had sex with a man whom they knew or suspected was having sex with another woman. Eighty-nine percent thought it extremely unlikely that they would get HIV or another STD in the next year.

Characteristics by Current Contraceptive Method

Contraceptive method groups differed in age, $F(2, 445) = 49.37, p < .001$; education, $\chi^2(4, N = 448) = 21.56, p < .001$; income, $\chi^2(2, N = 438)$ for Kruskal-Wallis $H = 8.04, p < .05$; and presence of children, $\chi^2(2, N = 447) = 11.58, p < .01$. Women who used the diaphragm were older, more educated, had higher incomes, and were more likely to have children. In addition, condom users reported having had more lifetime sexual partners, $F(2, 435) = 3.22, p < .05$.

Relationship stability, communication, decision-making power and condom negotiation self-efficacy were significantly associated with contraceptive method (see Table 1). Diaphragm users had been in a relationship longer and were more likely to be married than women in the other user groups. Both diaphragm users and condom users were more likely to report that they had communicated with their partners about birth control (96% and 93%, respectively) than had pill users (86%). As might be expected, condom users were more self-confident that they could negotiate condom use with their partners than were diaphragm and pill users. In addition, pill users reported the highest pregnancy decision-making power (as indicated by a higher score on the scale), and condom users reported the lowest.

Perceived partner motivation and satisfaction were also significantly related to current contraceptive method. A larger percentage of condom users reported that their partner thought it was of some importance to do something to prevent HIV/STIs. In contrast, a lower percentage of condom users reported the high partner satisfaction with current method. Twenty-seven percent of women who used condoms reported their partner was extremely satisfied with their current method, whereas 50% of diaphragm users and 69% of pill users reported this partner satisfaction level. Finally, whereas less than 30% of diaphragm and condom users reported that it was of some importance to have a method that can be used without the male partner's knowledge, 44% of pill users indicated that covert method use was of some importance.

User Group Comparisons Using Multinomial Logistic Regression

After adjusting for other variables in the model, we found that several relationship and partner variables were significantly associated with diaphragm use (see Table 2). Women

Table 1. Percentage or Mean (SD) of Relationship Characteristics by Current Contraceptive Method (n = 448)

Characteristics	Diaphragm (n = 140)	Pill (n = 187)	Condom (n = 121)
Relationship duration, in years***	12.30 (8.20)	7.04 (5.82)	7.16 (5.92)
Currently married**	78.6%	61.5%	67.8%
Relationship control	4.54 (0.42)	4.54 (0.39)	4.47 (0.50)
Decision-making for pregnancy prevention***	3.48 (0.67)	3.66 (0.68)	3.34 (0.56)
Communicate about birth control**	95.7%	86.1%	93.3%
Communicate about HIV/STDs	53.6%	63.6%	64.5%
Self-efficacy for condom use negotiation***	4.31 (0.79)	4.38 (0.68)	4.64 (0.56)
Partner motivation to avoid pregnancy			
Extremely important	51.4%	52.2%	51.2%
Less than extremely important	48.6%	47.8%	48.8%
Partner motivation to prevent HIV/STDs**			
Some importance	27.5%	26.9%	45.0%
No importance	72.5%	73.1%	55.0%
Partner satisfaction with method***			
Extremely satisfied	50.0%	68.8%	27.3%
Less than extremely satisfied	50.0%	31.2%	72.7%
Important partner likes method			
Very/Extremely Important	53.2%	55.1%	66.1%
Less than very/extremely important	46.8%	44.9%	33.9%
Important method can be used without partner knowing***			
Some importance	22.9%	44.4%	29.8%
No importance	77.1%	55.6%	70.2%

Note. *p*-values are for tests of significance with the Pearson chi-square test for categorical variables and ANOVA for continuous variables.

* *p* < 0.05 ** *p* < 0.01 *** *p* < 0.001

who reported their partner was extremely satisfied with their current method were more likely to be diaphragm users than condom users. In contrast, diaphragm use was less likely than pill use among women who viewed their partner as extremely satisfied with their method.

Perception that the partner placed some importance on HIV/STI prevention was associated with substantially lower odds of being a diaphragm user versus a condom user (odds ratio = 0.36). Having confidence in one's ability to negotiate condom use also was associated with lower odds of being a diaphragm user versus a condom user. Finally, women who placed some (rather than no) importance on covert use of a method were more likely to be pill users than diaphragm users.

Associations With Consistency of Diaphragm Use

Of the 140 current diaphragm users, 74 (53%) used the diaphragm consistently during the previous 3 months, whereas 66 did not. In bivariate analyses assessing characteristics associated with consistent diaphragm use, women who consistently used the diaphragm were older (*p* < .01). They also were more likely to have communicated with their partners about HIV/STD prevention (*p* < .05). Whereas 64% of consistent users had talked with their partner about disease protection, 42% of inconsistent users had done so. In addition, the two consistency groups differed on the perceived importance to partner of using the diaphragm (*p* < .001). Fifty-one percent of consistent users and 20% of inconsistent users believed their partner thought using a diaphragm was extremely important.

Logistic Regression of Consistency of Diaphragm Use

A multiple logistic regression model was fitted to assess the adjusted associations between consistency of diaphragm use and the three independent variables that were significantly related to consistency of use in the bivariate analysis. In this model, older age, having communicated about HIV/STDs, and perceptions of partner motivation to use a diaphragm were associated with consistent use (see Table 3). The odds of being a consistent user were almost three times higher among women who had talked with their partners about disease prevention and over four times higher for women who thought that using a diaphragm was extremely important to their partner.

Associations With Diaphragm Use Satisfaction

The majority (82%) of the 140 diaphragm users reported that they were somewhat or very satisfied with this method (*n* = 115). Satisfied diaphragm users did not differ significantly from non-satisfied users on relationship stability, communication, or power. However, the two satisfaction groups differed significantly on three partner-related variables: perceived partner satisfaction (*p* < .001), perceived importance of using a method liked by the partner (*p* < .05), and perceptions of whether the diaphragm could be used without the partner's knowledge (*p* < .01). Satisfied users were more likely to report that their partner was extremely satisfied with their current method (57% vs. 20%), but were less likely to report it was important to use a method that their partner liked (49% vs. 75%). In addition, satisfied diaphragm users were more likely to agree that the diaphragm can be used without their partner knowing (74% vs. 44%).

Table 2. Adjusted Odds Ratios (and 95% Confidence Intervals) from Multinomial Logistic Regression Analysis of Diaphragm Only Use (vs. Use of Condom Only and Pill Only; *n* =448)

	Condom Only	Pill Only
Age ^a	1.08 (1.03-1.13)**	1.12 (1.07-1.17)***
Education		
College graduate or more	2.36 (0.97-5.76)	2.41(1.08-5.39)
Some college	1.73 (0.68-4.43)	1.73 (0.73-4.09)*
Less than college (reference group)	1.0	1.0
Relationship duration ^a	1.06 (1.00-1.12)	1.04 (0.98-1.10)
Currently married		
Yes	0.60 (0.27-1.34)	1.07 (0.52-2.20)
No (reference group)	1.0	1.0
Decision-making for pregnancy prevention ^a	1.35 (0.85-2.14)	0.75 (0.49-1.14)
Communicate about birth control		
Yes	1.52 (0.43-5.36)	2.79 (0.94-8.25)
No (reference group)	1.0	1.0
Self-efficacy for condom use negotiation ^a	0.39 (0.25-0.63)***	0.93 (0.64-1.35)
Partner motivation to prevent HIV/STDs		
Some importance	0.36 (0.18-0.70)**	1.61 (0.84-3.11)
No importance (reference group)	1.0	1.0
Partner satisfaction with method		
Extremely satisfied	3.10 (1.68-5.71)***	0.40 (0.23-0.70)**
Less than extremely satisfied (reference group)	1.0	1.0
Important method can be used without partner knowing		
Some importance	0.70 (0.37-1.35)	0.44 (0.24-0.79)**
No importance (reference group)	1.0	1.0

Note. *p*-values are based on the Wald test for significance of logistic regression coefficients.

^a Odds ratios are for a one-unit increase in the independent variable.

p* < 0.05 *p* < 0.01 ****p* < 0.001

DISCUSSION

Consistent with previous research (e.g., Cabral et al., 1998; Harvey et al., 2002), our findings indicated that acceptability of contraceptive methods among women may be influenced by their male partner and relationship factors. More specifically, we found that use of a method was significantly associated with condom-use negotiation self-efficacy and the importance of covert use of a method. Partner factors (perceived motivation of the partner to prevent HIV/STIs and perceived satisfaction of the partner

with current method) also were associated with current method use. In addition, among diaphragm users, communication about HIV/STIs and perceived partner motivation to use a diaphragm were related to consistent use. Because small sample sizes precluded conducting multiple logistic regression analyses, differences between users who were satisfied or not satisfied with the diaphragm must be interpreted as tentative. Preliminary results suggest, however, that among diaphragm users, partner-related factors are associated with differing satisfaction levels.

Our findings provide new information about factors associated with use of specific methods. For example, partner satisfaction was more characteristic of diaphragm than condom users. In contrast, we found lower condom use negotiation self-efficacy and lack of partner motivation to prevent HIV/STIs were associated with diaphragm use (vs. condom use). Women currently using condoms presumably have had more experience in negotiating their use, and conversely, women who are comfortable negotiating condom may be more likely to use this method. Also, it is generally accepted that consistent use of the male condom is the most effective means to prevent HIV among individuals engaging in sexual intercourse. Therefore, these last two findings are not surprising.

Despite knowledge about the importance of male condom use for the prevention of HIV, the majority of individuals at risk do not use them consistently (e.g., Anderson, Brackill, & Mosher, 1996; Geringer, Marks, Allen, & Armstrong, 1993; St. Lawrence et al., 1998). Given this fact, it is imperative that other acceptable meth-

Table 3. Adjusted Odds Ratios (and 95% Confidence Intervals) from Logistic Regression Analysis of Consistency of Use by Characteristic (*n* = 140)

Characteristic	Adjusted Odds	
	Ratio	95% CI
Age	1.06	(1.01-1.11)*
Communicate about HIV/STDs ^a		
Yes	2.73	(1.29-5.80)**
No (reference group)	1.0	1.0
Partners motivation to use a diaphragm ^b		
Extremely important	4.65	(2.07-10.45)***
Other (reference group)	1.0	1.0

Note. *p*-values are based on the Wald test for significance of logistic regression coefficients.

^a Women who reported either yes or no to the question, "Have you ever talked with your partners about how to protect yourselves from HIV and other STDs?"

^b Women who perceived that it was extremely important or other than extremely important to their partner to use a diaphragm now when they had sex.

p* < 0.05 *p* < 0.01 ****p* < 0.001

ods be available to women and their partners. Our finding that partner satisfaction is associated with the diaphragm compared to the male condom suggests that if the diaphragm or diaphragm-like devices are proven effective in preventing HIV, some groups of women and their partners might be more likely to use these methods consistently than to use the male condom. The diaphragm might be more acceptable to some couples than the condom because it interferes less with the male partner's physical sensation during sexual intercourse. Women who may be unable or unwilling to negotiate male condom use may be able and willing to use a diaphragm, as their partners would be likely to find this method less objectionable. On the other hand, this finding could suggest that because the diaphragm is less popular than many other birth control methods, women only use it when their partners are highly satisfied with the method.

A larger percentage of pill users than diaphragm users reported that their partners were extremely satisfied with their contraceptive method. This finding may be an indication that male partners prefer coitus-independent contraceptives that do not interfere with spontaneous sexual expression. It is important that new products and devices to prevent HIV and other STIs are designed to embody such characteristics if they are to be maximally acceptable to women and to their male partners. Among coitus-dependent methods, those that could be inserted several hours before sexual intercourse may be more likely to be acceptable.

It is noteworthy that couple communication about HIV/STI prevention and partner motivation to use the diaphragm were associated with consistency of use. This finding is important because a growing body of literature (e.g., Harlow et al., 1993; Morokoff et al., 1997; Noar, Morokoff, & Redding, 2002) finds that individuals who are communicative and assertive about safer sexual behavior are more likely to engage in safer sexual behaviors, including condom use. Taken together, these findings suggest that, if the diaphragm is proven effective in preventing HIV or if diaphragm-like products become available, enhancing women's communication skills and providing women with information to share with their partners could potentially increase consistent use of these methods.

Although several recent studies indicated that relationship power (relationship control and decision-making) influences women's ability to protect themselves from unintended pregnancy and disease (Harvey et al., 2002; Pulerwitz et al., 2002; Soet et al., 1999), these factors were not associated with acceptability of the diaphragm in our study. This finding could be due in part to the measures of power and decision-making dynamics used in these analyses or to the limited number of measures of relationship power. It could also be due to the fact that the diaphragm is a female-initiated method that can be used covertly and women do not need to negotiate with men about diaphragm use. Alternatively, it could suggest that perceptions and concerns involving the male partner's feelings about a method are the most important interpersonal cor-

relates of acceptability of the method among women. Although women may have the ability to use the diaphragm without their partner's knowledge or consent, their behavior still is likely to be influenced by their perceptions about their partners' wishes and motivations. Therefore, interventions and education that focus on partner factors may be especially helpful for increasing the diaphragm's acceptability.

The present study provided little support for the importance to diaphragm users of covert use. Although over two thirds thought they could use a diaphragm without their partner's knowledge, most diaphragm users (77%) indicated that it was of no importance that they use a method without their partner knowing. This sample of diaphragm users was older than condom users and in longer-term, presumably more stable relationships. Women in long-term, stable relationships that supposedly are characterized by trust may believe that they should not or do not need to use a method covertly. However, the opportunity for direct or indirect covert use may still be an important benefit of the vaginal diaphragm for younger women in less stable relationships who are at higher risk of disease.

This study has several potential limitations. First, its generalizability may be limited. The data were collected from women members of one HMO in the Pacific Northwest who were primarily non-Hispanic White, well-educated, married, and at relatively low risk for HIV/STIs. Women of other ethnicities or of more diverse educational backgrounds may not share the same level of acceptability or associations between relationship characteristics and acceptability. Second, because these data are cross-sectional, it is not possible to draw causal inferences from the associations found. Third, the limited power resulted in fairly wide confidence intervals for the odd ratios. In addition, the number of current diaphragm users in the sample was not large, and sample sizes were not sufficient to allow for multiple logistic regression analysis by satisfaction level. Finally, our measures of relationship factors are limited. For instance, we only examined the presence or absence of communication on three birth control/STI topics. It is important for future research to examine the influence on acceptability of use of specific modes and strategies of communication as well as more finely-tuned measures of other relationship variables.

This study provides important information on the role of women's perceptions of their partner on acceptability of the diaphragm. More specifically, it demonstrates the value of including interpersonal (partner and relationship) factors when examining the acceptability of potential methods of HIV prevention. There is still much to be learned about the partner and relationship variables measured in this study. There have been few theoretical frameworks to guide such research. Moreover, our sample is limited to women who use the diaphragm as a method of pregnancy prevention. Should the diaphragm prove efficacious in preventing HIV, a more diverse group of women could find the diaphragm acceptable, and the factors that

influence its use could be different. In any case, it would be essential to consider partner factors and other relationship variables as well as intrapersonal factors when assessing who might find this or similar methods acceptable for HIV prevention.

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Manuscript accepted January 17, 2006