The Theory of Reasoned Action and the Role of External Factors on Heterosexual Men’s Monogamy and Condom Use

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Although the majority of prevention efforts have focused on women, reduction of heterosexual transmission of STDs also requires interventions for men, necessitating understanding of men’s safer sex decision making. In a random sample of 486 heterosexually active men, the theory of reasoned action (TRA) was used to predict intentions to use condoms with casual partners, as well as 2 steady-partner safer sex behaviors: mutual monogamy and condom use. The basic TRA model fit the data well. Expanded models identified the mediated (via attitudes, social norms, and self-efficacy) and, for some, direct effects on intentions and behavior of selected intrapersonal, interpersonal, and sociocultural variables. Results suggest that the role of external variables might vary depending on the behaviors in question.

Sexually transmitted diseases (STDs), including HIV, are widespread in the United States, with 15 million people becoming infected each year. STDs are associated with considerable morbidity and mortality, with women and their infants bearing a disproportionate burden of disease (Centers for Disease Control and Prevention [CDC], 2000). For this reason, research on the prevention of heterosexual transmission of STDs has focused largely on helping women to reduce their risk of acquiring infections from their male partners. However, as Campbell (1995) pointed out, effective prevention requires the involvement of both members of the sexual dyad, and a focus

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solely on women may increase their risk of acquiring an STD by reinforcing traditional gender-role beliefs that sexual safety is primarily the woman’s concern. There is growing recognition that heterosexual transmission of STDs cannot be prevented without effective interventions to reduce men’s risk as well (Campbell, 1995; Exner, Gardos, Seal, & Ehrhardt, 1999; National Institutes of Health, 1997; Program for Appropriate Technology in Health, 1997; Family Health International/AIDSCAP Women’s Initiative, 1996).

Condom use and mutual monogamy are the most frequently recommended safer sex methods (Britton et al., 1998; Donovan, 2000a, 2000b; Gavey & McPhillips, 1997; Kelly & Kalichman, 1995). Most research has focused on condom use, yet population-based surveys of adult sexual behaviors suggest that having only one partner is more prevalent than using condoms (Catania et al., 1992; Tanfer, 1994). In an attempt to advance research on heterosexual men’s sexual safety, we examine the utility of the theory of reasoned action (TRA; Fishbein & Ajzen, 1975) for predicting three safer sex strategies: monogamy, steady-partner condom use, and intention to use condoms with casual partners. Condom use is examined separately by partner type because prior research has suggested that predictors of condom use vary, depending on partner type (Morrison, Gillmore, & Baker, 1995).

In this study, we also examine intrapersonal, interpersonal, and cultural variables not specified by the TRA. In addition to possibly improving prediction, understanding the pathways through which they affect behavior can provide further information for intervention development. Because such variables are extraneous to the TRA, we specify our models with the TRA variables mediating the effects of these variables, consistent with Fishbein’s (2000) conceptualization, but we also examine whether these variables exert direct effects on intention, behavior, or both.

The Theory of Reasoned Action

The theory of reasoned action (Fishbein & Ajzen, 1975) has been widely used to model a variety of health-promoting behaviors (Norman, Abraham, & Conner, 2000) and has proven useful in predicting intention to use and use of condoms (for reviews, see Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Bennett & Bozionelos, 2000; Sheeran & Taylor, 1999). As shown in Figure 1, the TRA posits that a person’s intention to perform a behavior (e.g., use a condom) is the best predictor of subsequent behavior. Intention, in turn, is predicted by attitude toward the behavior (e.g., “Condoms are unpleasant”) and perceived social norms about performing the behavior (e.g., “People think I should use a condom”).
In a model specific to behaviors relevant to STD/HIV prevention, Fishbein (2000) included self-efficacy as an additional predictor of intention. All other variables, with the exception of skills and environmental constraints, are hypothesized to influence intention and subsequent behavior through attitude, social norm, and self-efficacy (see Figure 1, where such variables are conceptualized as interpersonal, intrapersonal, and sociocultural for the purposes of the present study).

### Variables Not Specified by the TRA

Several recent studies have found constructs not included in the TRA to be predictive of safer sex behaviors (primarily male condom use), but the mechanisms through which these effects occur are unclear. Although arguments could be made for the inclusion of a large number of variables, we used three criteria to choose interpersonal, intrapersonal, and sociocultural variables. We selected variables that either have been consistently shown to be related to heterosexual men’s risky sexual behaviors (e.g., substance use), are represented in several theories (e.g., perceived risk), or have been neglected in prior research (e.g., motivation for pregnancy). A brief rationale for each variable follows.

Among heterosexuals, pregnancy motivation and use of birth control are two factors that may affect safer sex decisions. The desire to have a child, rarely studied in the context of STD prevention, would conceivably preclude condom use. On the other hand, for those wishing to prevent a pregnancy, condom use may be seen primarily as a means of contraception (rather than

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**Figure 1.** Theory of reasoned action indicating hypothesized role of external variables.
a safer sex measure). Cooper, Agocha, and Powers (1999) found that young adults—regardless of race, age, gender, or relationship status—were more likely to use condoms to prevent pregnancy than to prevent disease. Accordingly, couples using other contraceptive methods often are less likely to use condoms (Critelli & Suire, 1998).

Studies have shown consistently that alcohol and drug use are related to sexual risk taking when substance use is measured globally (Leigh, 2002; Weinhardt & Carey, 2001). In addition, experimental studies have shown that alcohol use predicts greater motivation or intention to engage in risky sex, and reduces condom-use negotiation skills and perception of risk (Maisto, Carey, Carey, & Gordon, 2002; Maisto, Carey, Carey, Gordon, & Schum, 2004). In a review of studies examining the relationship between drinking and risky sex at two levels of analysis—global associations and event-specific associations—Cooper (2002) found that drinking was related to decisions to have sex and to have casual sex at both levels of analysis, but inconsistently related to condom use.

Perceived risk of infection is viewed as a fundamental precondition for changing behavior in several theories of HIV-risk behaviors (e.g., AIDS risk-reduction model: Catania, Coates, & Kegeles, 1994; health belief model: Janz & Becker, 1984). In a meta-analysis, Gerrard, Gibbons, and Bushman (1996) concluded that inconsistent findings in the literature may occur because few studies have used perceived risk to predict subsequent, rather than historical behavior and because of the complexity of prevention behaviors. Thus, continued investigation of this factor seems to be warranted.

Scant attention has been paid to the ways in which sexual behavior may be influenced by psychological distress. We include psychological distress because it is hypothesized to capture the effects of life stresses, both current and historical, that may affect sexual decision making. For example, accumulating evidence suggests that childhood abuse survivors may be overrepresented among individuals with HIV infection (Allers & Benjack, 1991) and that abuse is associated with increased levels of risk behavior (Cunningham, Stiffman, Dore, & Earls, 1994; Johnsen & Harlow, 1996; Lodico & DiClemente, 1994; Morrill & Ickovics, 1996; Zierler et al., 1991). Because child abuse is also related to adult psychological distress (Bagley, Wood, & Young, 1994; Cole & Putnam, 1992; Finkelhor, 1990; Finkelhor & Browne, 1985), psychological distress may capture many of the effects of this and other life stressors.

Traditional power imbalances in heterosexual relationships, with men having more control, have been cited as important factors in women’s sexual safety (Amaro, 1995; Campbell, 1995; Gupta, Heise, Weiss, & Whelen, 1996; Quinn, 1996; van der Straten, King, Grinstead, Serufilira, & Allen, 1995; Wight, 1992). These power imbalances may give men more control over
decisions concerning sexual activities. In our work with women at risk of STD/HIV, we have found that women with battering male partners report greater risk of STD/HIV from their partners and that their partners have more say with regard to safer sex, compared to women who are not battered (Beadnell, Baker, Morrison, & Knox, 2000). Hence, the role of domestic abuse deserves attention in research on heterosexual males and is included in the present study.

Sheeran and Taylor’s (1999) review examined the relationship of intention to use condoms with constructs not included in the TRA. They found that partner norms were strongly correlated with intention, but that perceived threat, sexual experience, knowledge, and demographic and personality variables had smaller correlations with intention. Partner norms may be particularly salient for behaviors such as condom use and monogamy that require partner cooperation.

Pleck, Sonenstein, and Ku (1993) examined the role of traditional male gender roles on young men’s heterosexual relationships. They found that males with more traditional attitudes toward masculinity reported more sexual partners in the prior year, a less intimate relationship with their current partners, and a greater belief that relationships between men and women are adversarial. Men who hold traditional attitudes may put themselves and their female partners at greater risk of STD/HIV than men with less traditional attitudes.

Finally, we include religiosity, a variable that has been found in several studies to be related to sexual behaviors within and across race/ethnic groups and ages (e.g., Lefkowitz, Gillen, Shearer, & Boone, 2004; McLaughlin, Chen, Greenberger, & Biermeier, 1997; Zaleski, Levey-Thors, & Schiaffino, 1998). This is also a variable that has received considerable attention in campaigns to reduce pregnancy and STD risks.

**Summary**

Although previous research has focused disproportionately on women, prevention of the heterosexual transmission of HIV and other STDs requires intervention with both members of the sexual dyad. With a sample of heterosexually active men, we examined the roles of cognitive factors specified by the TRA for three safer sex behaviors: monogamy and condom use with steady partners, and intention to use condoms with casual partners. Separate models for each behavior are indicated, since the antecedents of the behaviors might differ (Fishbein & Ajzen, 1975). In addition to predicting intention for each behavior, we examined the antecedents of actual behavior 4 months later for monogamy and condom use with
steady partners. We also examined intrapersonal, interpersonal, and socio-cultural factors not included in the theory but that may improve prediction and offer insights for intervention development. Finally, we identified the mediated or direct mechanisms through which they affect intentions and behaviors.

Method

Setting and Participant Characteristics

The present study was conducted in Seattle-King County, Washington, using a random sample of 486 men who were recruited from a geographic area with higher than average STD rates. Survey Sampling Inc. (Fairfield, CT) was retained to generate a random-digit-dialing sample of residential telephone numbers from the target area. Telephone ownership was unlikely to bias the sample because, according to the 1990 U.S. Census (n.d.), 98% of households in King County have telephones.

Geographic areas with disproportionate STD rates suggest the existence of individuals who are likely to be **core-group members**: those supporting the spread of STD in a population because of high rates of partner change (Holmes, 1994). To identify a geographic area in which core-group members live, we examined 5-year (1991–1995) epidemiological data among individuals age 18 and older for five STDs in King County. We then selected the area with the highest STD rates. This area contains 9% of the county population over age 18, but accounts for 43% of the cases of gonorrhea, 26% of chlamydia, 16% of Herpes Simplex Virus 2 (HSV-2), 50% of syphilis, 31% of AIDS, and twice the county average rates of pelvic inflammatory disease in women. In the target area, 35% of families with children have a female head of household, and 46% are White.

To be eligible, men needed to be between the ages of 18 and 40, English-speaking, sexually active with a female in the prior 2 years, and not exclusively sexually active with men in the prior year. Of the 956 households identified with an eligible man, 51% ($n = 486$) contained a man willing to participate in the study, 34% ($n = 321$) contained a man who declined, and 16% ($n = 149$) contained a man who enrolled but failed to come for the interview or cancelled.

Of the enrolled men, 54% identified their primary racial or ethnic group as White (non-Hispanic), 23% as African American, 10% as Asian American, 6% as Hispanic, 1% as Native American, and 4% as Other. There were 8% who endorsed more than one racial or ethnic group, and 2% of the total did not identify a primary race/ethnicity.
Men were predominantly lower and middle income (42% reported annual household incomes below $30,000; 36% reported between $30,000 and $62,000; and 22% reported over $62,000) and employed (76%). Their ages ranged from 18 to 40, with a mean of 30.1 years (SD = 6.2).

In terms of marital status, 62% were single and never married, 31% were married, 6% were divorced, and less than 1% (n = 2) were widowed. Participants reported an average of 1.4 sexual partners (SD = 1.1) in the prior 4 months. There were 28% of men who reported sex with a casual partner and 2% with a male partner in the prior 4 months. Of the 75% who had sex with a steady partner in the prior 4 months, 21% reported knowing or suspecting that their partners had other partners.

Procedure

All of the study procedures and protocols were approved by the University Human Subjects Review Board. Using lists of randomly generated phone numbers from the target geographic area, female study recruiters contacted households to identify men who were eligible for participation. If the recruiter reached a messaging system, she left a message identifying the study and asking someone from the household to call back. If no one called back, no more than two additional messages were left to avoid harassing individuals.

Following informed consent procedures, baseline data were collected via an audio-assisted computer-administered structured interview (audio-CASI). To facilitate participation, men were offered the option of completing surveys at the project offices (98% choose this option) or at their homes (2%). Men were scheduled to return for a follow-up administration of the audio-CASI 4 months after the Time 1 data collection. Follow-up was completed by 92% of the men (N = 445) who were surveyed at Time 1.

The 41 men who dropped out of the study were not significantly different from the remaining men in age, marital status, or ethnic/racial composition. However, they were significantly lower on levels of education, $\chi^2(6, N = 41) = 15.12, p = .05$; and income, $\chi^2(3, N = 41) = 8.03, p = .05$. In terms of variables used as analysis outcomes, no differences were observed between those who dropped out versus retained on baseline casual-partner condom-use intentions, $t(128) = 0.38, ns$, although dropouts were more likely to use condoms with their steady partners, $\chi^2(1, N = 41) = 4.71, p < .05$; and less likely to be monogamous, $\chi^2(1, N = 41) = 7.83, p < .01$.

Participants received an incentive payment of $20 for completing the Time 1 audio-CASI (with an additional $10 incentive for coming into the project office, rather than completing the survey at home). In addition, they received $50 for completing the 4-month follow-up survey.
Measures

Measurement design was guided by theory. We used previously tested and validated items whenever possible. Ajzen and Fishbein (1980) provided clear guidelines for the development and measurement of TRA variables. To maximize predictive power, TRA theory suggests that the measurement of behavior should be specific with regard to action, time, and target. Models consisted of a single outcome variable (i.e., behavior 4 months later); the four TRA variables (attitude, social norm, self-efficacy, and intention) measured at Time 1; and variables external to the TRA (intrapersonal, interpersonal, and sociocultural), also measured at Time 1.3

In the data collection, definitions were given for key terms. Steady partners were defined as “women [the men] had sex with, and had an ongoing relationship with.” Casual partners were defined as “women [the men] had sex with, but did not have ongoing relationships with.” We used two approaches to ensure that participants understood our use of the word monogamy. First, a mutually monogamous relationship was defined as one in which men “decide to have sex with only one woman and expect that the woman will not have other partners.” Additionally, items often did not use the word monogamy but, rather, used descriptive language (e.g., “How likely is it that you will have sexual intercourse with only one woman, who does not have other partners?”).

Steady-partner behaviors. Measures of monogamy and condom use with steady partners were constructed from information gathered concerning sexual activities. The time frame used was the prior 4 months, given evidence that self-report accuracy is maximized when moderate timeframes (i.e., 3 to 6 months) are used (Jaccard, McDonald, Wan, Dittus, & Quinlan, 2002). The measure of steady-partner condom use was a continuously distributed variable: the proportion of acts of anal sex, vaginal sex, or both with steady partners in which condoms were used.

We also asked men to indicate if they believed their steady partner (or main steady partner, if they had more than one) had had sex with others in the prior 4 months. Men were considered to be mutually monogamous (coded dichotomously as 0 or 1 for No or Yes, respectively) if they had sex with only one partner whom they believed to have no other partners.

TRA variables. TRA variables included attitudes, self-efficacy, social norm, and intentions. Each was measured specific to the three behaviors of interest. A time frame of the next 4 months was specified in all intention, self-efficacy, and attitude items.

3Copies of study measures are available upon request.
**Intention.** Intention to engage in each behavior over the next 4 months was measured using the mean of three items for each behavior, assessing the likelihood, strength of intention, and probability percentage of the behavior. Cronbach’s alphas for the three intention items are .81, .97, and .95 for monogamy, condom use with steady partner, and condom use with casual partners, respectively.

**Self-efficacy.** Self-efficacy for each of the behaviors over the next 4 months was measured using the mean of items for each behavior. Items were elicited in interviews with a separate random sample of 30 men from the target population. Men were asked to identify situations that might make it easy or difficult to remain in a mutually monogamous relationship to prevent STD/HIV (6 items) or to use condoms with a steady or casual partner (3 items each). Men rated the likelihood that they would be able to perform the desired behavior in each situation on a 7-point scale ranging from 1 (very unlikely) to 7 (very likely). Alphas for the sets of self-efficacy beliefs were .72, .61, and .64 for monogamy, condom use with steady partners, and condom use with casual partners, respectively.

**Attitudes.** Attitudes toward engaging in each behavior over the next 4 months were measured with the mean of four items of the form “Being in a mutually monogamous relationship would be . . .” or “Using condoms with my steady/casual partner(s) would be . . .”. Each behavior was rated on 7-point semantic differential items, anchored at the endpoints with *nice/*awful, *helpful/*harmful, *wise/*foolish, and *pleasant/*unpleasant. Alphas were .88, .87, and .66 for monogamy, condom use with steady partners, and condom use with casual partners, respectively. The choice of these items was based on our previous research measuring attitudes toward condom use, in which we factor-analyzed a larger number of adjective pairs. These items all loaded highly on the evaluative dimension, which also included *good/*bad.

**Social norms.** Social norms for each of the three behaviors were measured with the mean of three items assessing what the respondent believed “other people who are important to him” think he should do with regard to each of the behaviors. Responses were scored on a 7-point scale ranging from 1 to 7. Alphas were .80, .95, and .91 for monogamy, condom use with steady partners, and condom use with casual partners, respectively.

**Intrapersonal variables.** We measured four intrapersonal variables. Those variables are psychological distress, alcohol use, drug use, and pregnancy motivation.

**Psychological distress.** Psychological distress was assessed using the 53-item Global Severity Index (GSI) of Derogatis’ (1993) Brief Symptom Inventory (BSI). The BSI is a self-report scale that has been used widely in both research and clinical settings and that has well established reliability and validity. Alpha in the present sample was .96.
Substance use. Substance use was measured with two variables. For alcohol use, men were asked “Typically, when you drink alcohol, about how many drinks do you have on each occasion? (A drink is 12 ounces of beer, 4 ounces of wine, or 1½ ounces of hard liquor.)”. Use of recreational drugs was measured with the item “In the last 4 months, about how often have you used recreational drugs?”. Responses were rated on a 6-point scale ranging from 1 (not at all) to 6 (4 or more times a week).

Pregnancy motivation. Pregnancy motivation was assessed with a 16-item scale that was developed for the present study. Items were developed based on elicitation interviews with a random sample of 30 men from the target population. Open-ended questions were used to identify positive and negative aspects of causing a pregnancy in the next 4 months (e.g., “It’s important for a man to prove he is fertile”; “Getting a woman pregnant now could trap me in a bad relationship”). Responses were rated on a 7-point ranging from 1 (strongly agree) to 7 (strongly disagree). Negative items were reverse-scored so that higher scores argue for causing pregnancy. Alpha in the present sample was .86.

Interpersonal variables. We assessed four interpersonal variables. Those variables are perceived STD risk, partner norms, domestic abuse, and use of birth control other than condoms.

Perceived risk of acquiring an STD. We measured participants’ perceived risk of acquiring an STD with a single item for each steady and casual sexual partner: “In the next 4 months, how likely do you think you are to catch a sexually transmitted disease from [partner] if you do not use barrier protection during sexual intercourse?”. Responses were rated on a 7-point scale ranging from 1 (very unlikely) to 7 (very likely). For casual-partner condom use, the mean of the risk estimates for all casual partners was used.

Partner norms. Partner norms for monogamy and condom use were examined using items specific to the behaviors and to the respondents’ partners. For monogamy, men were asked “Couples have different understandings about whether or not it is OK to have sex outside of their current relationship. What does [partner] think about you having sex with others in the next 4 months?” Responses were rated on a 7-point response scale using the anchors She doesn’t care if I have sex with others and She thinks I should not have sex with others.

For condoms, men were asked “Some women want their partner to use a male condom and some don’t. What does [partner] think about using condoms in the next 4 months?”. Responses were rated on a 7-point response scale using the anchors She thinks I should not use a male condom and She thinks I should use a male condom.

Following TRA measurement recommendations for assessment of normative beliefs, men were also asked their motivation to comply with each
partner. Responses were rated on a 7-point scale ranging from 1 (very little) to 7 (very much). Text for the item was “Generally speaking, how much do you try to do what [partner] would like you to do?” The final variable is the cross-product of perceived norm and motivation to comply.

Domestic abuse. Domestic abuse perpetrated by the man against his main steady partner was assessed with the mean of seven items asking about frequency of occurrence of verbal abuse and of controlling, threatening, and physically assaultive behaviors in the prior year. Item selection and construction were based on literature review and consultation with a domestic abuse expert. Alpha in the present sample was .70. Similar items have been used in prior studies and have shown good predictive utility (Beadnell et al., 2000).

Birth-control methods. To identify the use of birth-control methods other than condoms, men were asked to indicate if they or their partners had been sterilized or used birth-control pills, Depo-Provera™, rhythm or natural family planning, Norplant™, or emergency contraception (i.e., “morning-after” pills) in the past 4 months. Items were scored 1 if any of these methods were used and 0 if none were used. About one third (36.2%) of the men reported the use of one of these methods of birth control.

Sociocultural variables. We measured two sociocultural variables. Those variables are male gender-role attitudes and frequency of church attendance.

Male gender-role attitudes were measured using the mean of Pleck et al.’s (1993) eight-item Male Role Attitude Scale (MRAS). The scale includes items such as “It is essential for a man to get respect from others,” “A man will lose respect if he talks about his problems,” “A man should be physically tough, even if he is not big,” and “Men are always ready for sex.” Items were rated on a 4-point response scale ranging from 1 (disagree a lot) to 4 (agree a lot). The scale has been shown to have adequate reliability and good discriminant validity with adolescents (Pleck, Sonenstein, & Ku, 1994). Alpha in the present sample was .71.

Frequency of church attendance. Frequency of church attendance was measured with an item that was developed for the National Health and Social Life Survey (Laumann, Michael, & Gagnon, 1994): “How often do you attend religious services?” Items were rated on an 8-point scale ranging from 1 (never) to 8 (every week or more).

Results

Data Analysis

Separate models were tested for each of the three safer sex strategies: mutual monogamy, steady-partner condom use, and casual-partner condom
use. These three outcomes were chosen because they were endorsed most frequently by respondents. We considered testing models for abstinence from sex and use of female condoms. However, only 1 man reported using abstinence as a method to prevent STDs, and only 19 reported any use of female condoms.

We chose path analysis to estimate all models because it allowed estimation of the unique contribution of each variable, while avoiding violations of sample-size guidelines (given the number of parameters in the model) that would have occurred in a fully latent variable model (Kline, 2005; Tabachnick & Fidell, 2001). To account for known measurement error, variables measured by scales were included as latent constructs with single indicators (i.e., scale score) and the residual variance fixed to that estimated by Cronbach’s alpha (Kline, 2005):

\[ \text{error variance} = (1 - \text{Cronbach's } \alpha) \times \text{observed variance} \]

We used the statistical package Mplus 3.12 (Muthén & Muthén, 2004).

Because non-normality was present for some variables, estimation techniques providing robust statistics were used (Muthén, 2002; Muthén & Muthén, 2004). For the mutual monogamy model (a categorical outcome), we used a weighted least squares parameter estimation (WLSMV, as referred to in the Mplus software; Muthén & Muthén, 2004), and for the two condom-use models (continuous outcomes), we used maximum likelihood parameter estimation (MLM, as referred to in the Mplus software; Muthén & Muthén, 2004) with robust standard errors. All variables were below the guidelines for skewness and kurtosis (<3 and <10, respectively) recommended by Kline (2005). Skewness was less than 1.5 for 65% of the variables and less than 2.5 for the remainder; while kurtosis was less than 1.5 for 59%, and between 3.7 and 7.4 for the remainder.

For each model, we assessed overall fit by the chi-square statistic, comparative fit index (CFI; Bentler, 1990), the Tucker–Lewis Index (TLI; Tucker & Lewis, 1973), the residual mean squared error of approximation (RMSEA; Browne & Cudeck, 1993), and the weighted root mean square residual (WRMR; Muthén & Muthén, 2004). Fit was considered acceptable when WRMR was less than .90 (Muthén & Muthén, 2004), chi-square statistic was nonsignificant (\( p > .05 \)), CFI and TLI were greater than .95, and RMSEA was below .06 (Hu & Bentler, 1999).

As a preliminary step, we first tested basic TRA models that did not include any external (intrapersonal, interpersonal, and sociocultural) variables (Figure 1). As will be described, behavior was the outcome in the steady-partner (i.e., monogamy and condom use) models; and intention, rather than behavior, was the outcome in the casual-partner condom-use model.
Then, we estimated the expanded models that included the external variables. Because attitudes, social norms, and self-efficacy are likely to mediate the effects of other factors (Fishbein, 2000), paths from the external variables to these variables were freely estimated, but those to intention and (for steady-partner models) behavior were fixed to 0. However, given prior research findings, we expected that some external variables might also have direct effects on intention and behavior. Hence, if good fit was not found, we systematically freed one parameter at a time from the external variables to intention or behavior, based on modification indexes. Once the criteria for good model fit were met, no further modifications were made. Difference tests between the initial and final expanded models were performed using the Satorra–Bentler scaled chi-squares (Satorra, 2000) for MLM-estimated models and, for WLSMV models, difference chi squares calculated from derivatives from the nested and non-nested models (Muthén & Muthén, 2004).

The sample size for the casual-partner condom-use model was smaller because fewer respondents reported having had sex with casual partners. Because the sample size would be further reduced if behavior at the follow-up assessment were included (since not all men who had casual partners at Time 1 also had them at Time 2), this model was reduced in two ways. First, as mentioned, we estimated intentions at Time 1 as the outcome variable, rather than behavior itself. Second, we included only the variables (i.e., drug use and casual-partner norm) found in an initial regression analyses to have statistically significant \( p < .05 \) roles in predicting intention.

**Preliminary Analyses**

Intercorrelations among the model variables are presented in the Appendix (see Tables A1–A3). The amount of missing data was small; less than 2% of study participants had missing data on any one variable, except for condom use with steady partners (4%). To prevent the loss of study participants resulting from listwise deletion of cases with missing data, a single missing-data imputation was performed using the expectation–maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977), a method believed to produce minimal bias when the amount of missing data is small (Schafer & Graham, 2002).

\(^4\)For the 80 individuals who had casual partners at Time 2, intention and subsequent condom use were associated \( r = .46, p < .001 \).
Tests of the Basic TRA

Results of tests of the basic TRA for the three outcomes (i.e., monogamy, steady-partner condom use, and intention to use condoms with casual partners) are shown in Table 1. Monogamy models included the 305 men who reported having a steady partner at baseline and having had vaginal or anal sex with any kind of partner at follow-up. The steady-partner condom-use model included the 287 men who had a steady partner at baseline and a steady partner at follow-up (usually, but not invariably, the same person). The casual-partner condom-use intentions model included the 130 men who reported having a casual partner at Time 1.

The monogamy model did not have acceptable fit, \( \chi^2(3, N = 305) = 20.34, p < .001 \) (CFI = .88, TLI = .84, RMSEA = .14, WRMR = .76), until the path from self-efficacy to monogamy was freed. This produced a statistically significant improvement in fit, \( \chi^2_{\text{difference}}(1) = 13.17, p < .001 \). Other paths that were statistically significant were in the direction the model would predict. Three paths were not statistically significant: from self-efficacy to intentions in the casual-partner model; and from social norm to condom-use intentions in both the casual- and steady-partner models. However, zero-order correlations of these relationships were statistically significant (\( r = .48, .45, \) and .59, respectively; all ps < .001; see Appendix).

Thus, correlations with other predictors appear to have accounted for the statistical insignificance of the paths in the models. For example, correlations with other TRA variables (i.e., attitude, self-efficacy) ranged from .42 to .48, and the correlation was .69 between steady-partner condom attitude and norm. The effects of the latter correlation are illustrated by the fact that when a model that excluded attitude was tested, these paths became statistically significant. Hence, in the case of nonsignificance, it appears that the predictors did not have an effect above and beyond their interrelationship with attitude.

Tests of Expanded Models

Table 2 shows the fit indexes and chi-square difference statistics for the initial and final expanded models. None of the initial models had acceptable fit to the data. All three final models fit the data well and, in all cases, the fit was significantly better than that for the corresponding initial expanded model.

Monogamy. The initial model included an estimated path from self-efficacy to monogamy, given that it was statistically significant in the basic model test. For the final expanded model (Figure 2), three paths were freed;
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<th>Behavior</th>
<th>Endogenous</th>
<th>Exogenous</th>
<th>Standardized coefficient</th>
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<td>Social norm</td>
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<td>Condom use, steady partner b</td>
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<td>Social norm</td>
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<td>Condom use, casual partners c</td>
<td>Intentions</td>
<td>Self-efficacy</td>
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<td>Social norm</td>
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Note. TRA = theory of reasoned action; WLSMV = maximum likelihood parameter estimation; MLM = maximum likelihood parameter estimation; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; WRMR = weighted root mean square residual.

*Based on WLSMV estimation (Muthén & Muthén, 2002). Model fit indexes: $\chi^2(2, N = 305) = 4.21, ns$; CFI = .99, TLI = .97, RMSEA = .06, WRMR = .33, after freeing the path from self-efficacy to monogamy. **Based on MLM estimation (Muthén & Muthén, 2004). GFI: $\chi^2(3, N = 287) = 1.02, ns$; CFI = 1.00; TLI = 1.00; RMSEA = .00; WRMR = .13. ***Based on regression using MLM estimation.

*p < .05. **p < .01. ***p < .001.
Table 2

*Goodness-of-Fit Statistics and Difference Tests for Initial Versus Final Expanded Models of Monogamy and Condom Use*

<table>
<thead>
<tr>
<th>Method</th>
<th>$n$</th>
<th>Model</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>WRMR</th>
<th>$\chi^2 (df)^a$</th>
<th>$\chi^2$ difference $(df)^b$</th>
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<td>.10</td>
<td>.62</td>
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<td></td>
<td></td>
<td>Final</td>
<td>.98</td>
<td>.96</td>
<td>.04</td>
<td>.34</td>
<td>17.50 (11), ns</td>
<td>25.31 (2)***</td>
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<tr>
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<td>.70</td>
<td>.11</td>
<td>.60</td>
<td>102.74 (23)***</td>
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<tr>
<td></td>
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<td>Final</td>
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<td>.97</td>
<td>.04</td>
<td>.36</td>
<td>28.45 (21), ns</td>
<td>59.26 (2)***</td>
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<td>.88</td>
<td>.10</td>
<td>.43</td>
<td>6.69 (3), ns</td>
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<td>1.00</td>
<td>.00</td>
<td>.05</td>
<td>0.26 (1), ns</td>
<td>6.43 (2)*</td>
</tr>
</tbody>
</table>

*Note. CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; WRMR = weighted root mean square residual.*

*aStatistics for the monogamy model are from WLSMV estimation, statistics for the condom-use models are from MLM estimation.*

*bComputed using Satorra–Bentler (Satorra, 2000) scaled $\chi^2$ difference tests for condom models and $\chi^2$ differences calculated from initial and final monogamy models (see text).*

*$p < .05$. ***$p < .001$.***
Figure 2. Standardized coefficients estimated in a path model predicting monogamy at follow-up (n = 305). While paths were estimated from all intrapersonal, interpersonal, and sociocultural variables to self-efficacy, attitude, and norm, only those that were statistically significant are shown.
this model explains 51% of the variance in monogamy. There are three variables (i.e., psychological distress, drug frequency, alcohol amount) that had no statistically significant effects in the model. The effects of two variables were fully mediated by TRA variables: domestic abuse by social norm, and church attendance by self-efficacy. Also, three external variables directly influenced either intention or behavior. Partner norm directly influenced intention, in addition to its effect mediated by self-efficacy, attitude, and norm. Similarly, motivation for pregnancy and gender-role attitudes directly influenced monogamy, in addition to their effects on cognitive factors (i.e., both of these constructs influenced self-efficacy, and pregnancy motivation influenced attitude).

Of interest was that the direct effects of two external variables on behavior—pregnancy motivation and gender-role attitudes—were larger in magnitude (.33 and -.37) than those of the TRA variables of self-efficacy and intention (.23 and .20). In follow-up analyses, no statistically significant change in model fit was seen comparing this model to one in which the pregnancy motivation path was constrained to be equal to those for self-efficacy and intention, suggesting that these paths did not truly differ, $\chi^2_{\text{difference}}(2) = 2.38, ns$. However, fit did change when the gender-role attitudes to monogamy path was constrained to be equal to the self-efficacy and intention paths, $\chi^2_{\text{difference}}(2) = 24.30, p < .0001$, suggesting that it was indeed larger, making it the single strongest predictor of monogamy.

Steady-partner condom use. Two paths to intentions (from other birth-control use and partner norm) were freed for the final expanded model (Figure 3), which explains 46% of the variance in condom use. Other birth-control use directly influenced intention, but had no mediated effects; and partner norm directly influenced intention, in addition to its mediated effects via self-efficacy, attitude, and norm. There are three variables (i.e., perceived risk, psychological distress, drug frequency) that had no statistically significant effects in the model. In addition, five variables had mediated effects, but no direct effects on intention or behavior: Domestic abuse and church attendance had mediated effects via social norm; alcohol amount and traditional gender-role attitudes had mediated effects via attitude; and pregnancy motivation had mediated effects via self-efficacy and norm.

Casual-partner condom-use intentions. The path model for casual-partner condom-use intentions (Figure 4) included only the external variables of recreational drug use and casual-partner norm (as mentioned, the significant predictors of intention in a preliminary regression). Variables not significantly associated with intention were other birth-control use, alcohol amount, psychological distress, perceived risk, gender-role attitudes, and church attendance. The final expanded model explained 58% of the variance in intention to use condoms. Drug use had a direct effect on intention. While
Figure 3. Standardized coefficients estimated in a path model predicting steady-partner condom use at follow-up (n = 287). While paths were estimated from all intrapersonal, interpersonal, and sociocultural variables to self-efficacy, attitude, and norm, only those that were statistically significant are shown.

*Correlations*
- Self-efficacy and attitude = .28***
- Self-efficacy and norm = .27***
- Norm and attitude = .30***
Figure 4. Standardized coefficients estimated in a path model predicting casual-partner condom-use intentions (n = 130). Only variables found to predict intentions (p < .05) in preliminary regression were included in the estimation of the model; those ruled out are shown in dashed boxes/ovals (see text).
the path from partner norm to intention was freed to achieve good model fit, it was not statistically significant, leaving only a mediated effect on intention. As in the basic TRA model, the relationships between social norms and self-efficacy with intention were not significant.

Summary of Results

In each model, some variables had effects mediated by the TRA variables of self-efficacy, attitude, and social norm, while others directly affected intention, behavior, or both. There are two variables that had no significant roles in the models: perceived risk and psychological distress. Partner norm had a substantial role in all three models. In the casual-partner condom-use model, it had mediated effects; and in the steady-partner condom use and monogamy models, it had mediated and direct effects. There are four other variables that had significant direct effects on intention or behavior in at least one model: use of other birth control, drug use frequency, pregnancy motivation, and traditional gender-role attitudes.

Discussion

The present study was designed to further current knowledge about the sexual behaviors of heterosexually active men. The primary purposes of the reported analyses were (a) to examine the utility of the TRA for predicting, among heterosexual men, decisions about three safer sex strategies: steady-partner monogamy, steady-partner condom use, and casual-partner condom intentions; and (b) to examine the ways in which intrapersonal, interpersonal, and sociocultural variables external to the TRA are mediated by model constructs of attitude, perceived norm, self-efficacy, and intention.

Utility of the TRA for Predicting Men's Safer Sex Decisions

Results of path analyses testing the basic TRA indicate that the data produced a good fit to the models for each of the three outcomes. These models predicted half or more of the variance in steady-partner monogamy and condom use, and casual-partner condom-use intention. These results replicate the findings of prior studies with regard to the utility of the TRA for predicting condom use and condom-use intentions (Albarracin et al., 2001) and for predicting health outcomes more generally (Conner & Norman, 1996). Additionally, the results extend these findings to monogamy, a behav-
ior that rarely has been examined in prior research, but that is the method chosen by many men with steady partners.

For all three outcomes, intention was related more strongly to attitude than to social norm or self-efficacy. This is consistent with findings from Armitage and Conner’s (2001) meta-analysis of the theory of planned behavior (cf. Ajzen, 2002), which showed that, across a range of behaviors, attitude generally has a stronger relationship to intention than does norm. Our measure was a multi-item scale with good reliability, so our results do not support Armitage and Conner’s suggestion that inadequate, single-item measures of norm might account for its weaker predictive role. However, our results are consistent with theory: Fishbein and Ajzen (1975) noted that the relative weights of attitude and norm should be expected to vary across behaviors and, within a behavior, across populations. An avenue for future theory development may be to delineate factors that distinguish behaviors that are more attitudinally versus normatively driven.

Self-efficacy was significantly related both to monogamy intention and behavior and to steady-partner condom-use intention, but not to casual-partner condom-use intention. This latter result, which was initially surprising, may stem from the fact that respondents, overall, felt efficacious about using condoms with casual partners (the mean for this variable was almost 6 on a 7-point scale). Average self-efficacy to use condoms with steady partners, in contrast, was close to the scale midpoint. This suggests that condom-use self-efficacy reflects the difficulty of interpersonal negotiation about condom use, rather than mastery of the logistics of obtaining and wearing condoms. Monogamy self-efficacy also had a significant direct path to behavior, suggesting that these skills do, indeed, increase ability to be monogamous, over and above their effect on intention.

Examining the Expanded Models

Our expanded models represent an attempt to examine the roles of other factors previously demonstrated to be related to safer sex behaviors. In general, their roles depended on the behavior examined, with few having consistent effects across models. They are discussed by cluster (interpersonal, intrapersonal, and sociocultural).

Interpersonal variables. The most consistent and strongest effect among the external variables was perceived partner norm. In all three models, partner norm had substantial positive effects on attitude, norm, and self-efficacy. In the two models specific to steady partners—monogamy and steady-partner condom use—it was also directly related to intention. It is important to note that this effect was over and above its mediated effect through a related construct, general social norm.
The powerful role of partner norm underscores the importance of men’s perceptions of their partners’ wishes in their sexual decision making and has implications for theory. Sexual behaviors that transmit STDs inherently involve two people, but conceptual models typically are based on individual, rather than dyadic decision making. For example, the TRA emphasizes general social norms although, for dyadic behaviors such as sexual intercourse, partner norm may be the more important factor. It also is interesting that in all models, partner norm was related to self-efficacy. This suggests that men who perceive support from their partners feel more able to be monogamous or use condoms. Clearly, there is a need for theory development to take into account partner influences on sexual decision making.

Perceived risk, included in the steady-partner condom and monogamy models, was unrelated to intention or behavior, directly or indirectly. Although some theories (e.g., health belief model: Janz & Becker, 1984) specify perceived risk as a major determinant of health behaviors, findings from empirical research have been mixed (Abraham & Sheeran, 2000). Moreover, men are likely to make choices about monogamy or using condoms with steady partners for reasons other than perceived health risks (e.g., intimacy, birth control). Although our measure of risk perception represented an improvement over prior measures by being partner-specific, as suggested by Ellen, Adler, Gurvey, and Dunlop (2002), it may have been inadequate because it was based on a single item.

Use of birth control other than condoms was inversely related to intention for steady-partner condom use, but had no effect on intention for casual-partner condom use. The finding for steady partners supports the suggestion that condoms are often seen as a birth-control method and are less likely to be used when couples are using another method of birth control (Cooper et al., 1999; Critelli & Suire, 1998). The lack of effect for birth control in the casual-partner model suggests that condoms are used for both birth control and disease protection with such partners. That is, condoms and other methods of birth control are not substitutable in such situations.

Domestic abuse was negatively related to men’s perceptions of norms for monogamy, and positively related to norm for steady-partner condom use. The monogamy finding is consistent with our prior research (Beadnell et al., 2000), which showed that, relative to men who do not abuse their steady partners, abusers are more likely to be non-monogamous. It extends this by suggesting one of the mechanisms— influencing perceptions of norms— through which domestic abuse may affect monogamy. There may be a subset of men who subscribe to more traditional, patriarchal male gender-role beliefs in which violence is not heavily sanctioned (and is possibly even condoned), and for whom “playing the field” is encouraged as a sign of male
virility. In fact, traditional gender-role attitude, discussed later, was posi-
tively and significantly related to domestic abuse ($r = .23, p < .001$).

**Intrapersonal variables.** In the models concerning steady partners (i.e.,
condom use, monogamy), pregnancy motivation had the largest effects
among the intrapersonal variables. As expected, pregnancy motivation had
effects on monogamy and steady-partner condom use but, contrary to expec-
tations, not on casual-partner condom-use intentions. In the monogamy
model, pregnancy motivation’s effects were mediated by both attitudes and
self-efficacy. Many couples become monogamous, or increase their commit-
tment to monogamy, when they decide to have children. This commitment
may create more positive attitudes toward monogamy, and also may provide
support for resisting competing motivations to have multiple partners,
reflected in increased self-efficacy. In this model, pregnancy motivation also
had a direct path to actual behavior, over and above its mediated effects. This
may be a result of the fact that pregnancy motivation, although measured as
an individual factor, is likely to be related to one’s partner’s pregnancy
motivation. Insofar as a man’s desire for a pregnancy reflects a motivation
shared with his partner, he may experience external pressure to be monoga-
mous, and may be increasingly committed to his partner’s monogamy as well.

In the model for steady-partner condom use, pregnancy motivation was
not related to attitude, but was negatively related to norm and self-efficacy.
The fact that men with higher pregnancy motivations perceived norms
less favorable toward condom use with their steady partners is reasonable,
given that condom use would be seen by important others as inconsistent
with procreation. Men also may be less confident about their ability to use
condoms within a steady relationship when pregnancy is desired, possibly
because of partner resistance or because they cannot attribute the need for
condom use to contraception (making a desire for condom use appear to be
an admission of lack of fidelity).

Why pregnancy motivation affected norms and not attitudes toward
steady-partner condom use and no variables concerning casual-partner
condom use are interesting questions. Zero-order correlation of pregnancy
motivation with steady-partner condom attitudes ($r = .13, p < .05$), casual-
partner condom norms, ($r = -.17, p < .05$), and casual-partner condom-use
intentions ($r = .22, p < .05$) were small but significant. In the multivariate
models, the shared variance of pregnancy motivation with other included
predictors, especially partner norm, may cause its role to be nonsignificant.
Pregnancy motivation appeared to be somewhat shared with partners, as
suggested by its correlations with casual- and steady-partner condom-use
norms ($r = -.23$ and $-.28$, respectively, $ps < .05$).

Although neither drinking nor drug use influenced monogamy, directly or
indirectly, each had a small effect in the other models: alcohol on attitudes
toward steady-partner condom use; and drug use directly on intention for casual-partner condom use. Findings in the literature regarding the relationship of substance use to sexual behavior have been mixed, with some studies showing a relationship and others not. When such relationships have been found, they have typically shown an inverse relationship between substance use and safer sex. What is unusual in our findings is the positive relationship between substance use and intention to use condoms. Perhaps widespread public health messages that substance use increases risk taking, and messages to use condoms that have been aimed directly at drug users have been successful. It is important to note, however, that the size of these effects was relatively small. In interpreting these effects, it is important to remember that our measures of drinking and drug use were global measures, not tied to specific sexual activities and, as Leigh and Stall (1993) have pointed out, causal claims cannot be made on the basis of such measures.

Psychological distress was not significantly related to variables in any of the models. Our measure of psychological distress—the GSI of the BSI (Derogatis, 1993)—is a well validated measure ($\alpha = .96$ in the present sample), so measurement in adequacy is unlikely to be the reason for this nonsignificant finding. Our interest in including this variable was based on the idea that psychological distress might be a proxy measure for earlier traumatic experiences, which have been found to be related to risk behavior (Cunningham et al., 1994; Johnsen & Harlow, 1996; Lodico & DiClemente, 1994; Morrill & Ickovics, 1996; Zierler et al., 1991). More direct measures of such experiences may be advisable in such research.

**Sociocultural variables.** Men who endorsed more traditional male gender-role beliefs had lower self-efficacy for monogamy and were less likely to be monogamous. The latter was shown by a direct path to behavior that was more than twice as large as either of the indirect paths. This suggests that other factors, not specified by the TRA, mediate this relationship.

What might these factors be? It may be that men who hold more traditional gender-role attitudes may socialize with others who themselves model non-monogamy. In any event, more research is needed to explicate this relationship. Men who held more traditional gender-role attitudes also had less positive attitudes toward steady-partner condom use, which is also consistent with our speculations concerning normative influences. Gender-role attitudes were not related to intention to use condoms with casual partners, perhaps because condom use itself is consistent with having casual relationships.

Church attendance was related only to norm for steady-partner condom use. Men who attend church more often perceived norms less favorable toward steady-partner condom use, which is also consistent with our speculations concerning normative influences. Gender-role attitudes were not related to intention to use condoms with casual partners, perhaps because condom use itself is consistent with having casual relationships.
Summary and Theoretical Implications

Our results suggest that the basic TRA predicts heterosexually active men’s practice of monogamy, condom use with steady partners, and intention to use condoms with casual partners quite well. Not only did the models produce a good fit to the data, the amount of variance in outcomes explained in these models was not trivial, ranging from .46 to .58.

Most of the effects of non-TRA variables were mediated by TRA variables, as specified by the theory. There also were several variables that had direct effects on intention, behavior, or both. In each case, the variables associated with these direct paths involved some aspect of social interaction. That these paths were not fully mediated by attitudes, norms, and self-efficacy, as would be predicted by theory, is probably a result of the fact that the sexual behaviors examined intrinsically involve another person. This is in contrast to conceptual models based more on individually driven decision making. As Norman and Conner (1996) have noted, we must advance theories that incorporate factors, beyond to cognitions. In the area of sexual behaviors, this includes the dynamics of the sexual dyad’s relationship (e.g., partners’ norms about safer sex methods and distribution of power in the relationship) and the sometimes contradictory motive of pregnancy desire.

With the exception of partner norm, which had robust effects across all three behaviors, the external variables we examined had effects unique to each behavior examined in terms of what cognitive factors mediated their effects. Because our models were models of specific methods of safer sex behavior, it is not surprising that the effects of the external variables were partially contingent on the particular behavior examined. Because there is not yet theory that specifies which cognitive factors should mediate the effects of which external factors, we estimated saturated models initially in which each external variable was specified as affecting all three mediating variables (i.e., attitude, norm, self-efficacy). This procedure may have increased the possibility that some of the relationships observed were a result of chance. Our models represent only a first step in building more comprehensive models of safer sex behaviors. Clearly, replication of our findings is needed, and more theory development could lead to better specified models.

Disregarding the mediational mechanisms, five variables did have effects in both of the steady-partner (i.e., monogamy, condom use) models. Two variables (i.e., partner norm, gender-role attitudes) had effects with the same directions in both models (partner norms increasing safer sex behaviors; more traditional gender-role attitudes decreasing them). Three variables had inconsistent effects: Pregnancy motivation and church attendance increased monogamy, but decreased condom use; and domestic abuse decreased
monogamy, but increased condom use. Whether these three particular predictors increase or decrease risk in any appreciable way, or merely lead to specific preferences for managing risk, is a topic for further research.

**Intervention Implications**

This study’s results offer guidelines for safer sex interventions with heterosexual men. Our methodology was based on the idea that there are different methods of sexual safety and that condom use, which is most commonly prescribed, is only one. The methods available depend on a man’s particular life circumstances (i.e., his partnership status), and men are likely to vary in their natural preferences. Determining effective approaches that match people’s preferences is most likely to result in sustained risk reduction. Interventionists should assess such individual desires and assist men in determining the approach that is both effective and matches their circumstances.

The results provide information about cognitions to target in interventions for heterosexual men. To increase monogamy and steady-partner condom use, and to strengthen intentions toward casual-partner condom use, interventions might profitably target attitudes and the beliefs that underlie them. The particular outcome beliefs identified in this sample have been reported elsewhere (Gillmore et al., 2003) and provide a starting point for understanding those that are most salient for heterosexual men. The fact that self-efficacy had roles in both steady-partner models (i.e., monogamy, condom use) supports the provision of skills-training intervention, an STD risk-reduction approach that has been successful with other populations (Baker et al., 2003). Changing perceived social norms, implicated in the monogamy model, might be more challenging. However, interventions can attempt to reduce men’s motivation to comply with those important others who support risk taking, an approach that has been one component of at least two efficacious interventions: one with gay and bisexual men (Roffman et al., 1998), and one with heterosexual women (Baker et al., 2003).

The consistent across-model effect of partner norm has important intervention implications. In the present sample, having partners who supported monogamy or condom use increased self-efficacy, attitude, and perceived general norm, as well as intentions themselves. This suggests the continued provision of education and intervention for women, given their apparent strong influence on their male partners. Additionally, enlisting both members of couples in intervention activities may be a powerful risk-reduction approach.

It may be challenging to affect variables external to the TRA in traditional safer sex interventions. Pregnancy motivation, for example, most likely
results from the culmination of a number of life circumstances, such as relationship length and commitment, and an individual’s spiritual beliefs. However, such factors can be useful in determining preferred strategies: With steady partners, both church attendees and those wanting a pregnancy appeared to prefer monogamy, rather than condom use. Assuming that neither partner has a transmittable disease and that the monogamy is agreed upon, these strategies are reasonable choices.

The role of traditional gender-role beliefs and domestic abuse bear consideration. The success of changing traditional beliefs and their impact on non-monogamy, or at least altering intentions and behavior despite them, is a subject for further study. The negative effect of domestic abuse on sexual safety occurred by reducing perceived norm for monogamy, suggesting that these men are particularly motivated to comply with those around them who support non-monogamy. Whether the STD risk they pose to themselves and others is offset by their increased perceived social norm for condom use is unclear. Obviously, the elimination of domestic abuse would be the preferred goal of intervention. Unfortunately, this is likely beyond the scope of many STD education and prevention activities. Perhaps a salient implication is for interventions for women: education that domestic violence can create a context that increases their STD acquisition risk, in addition to the other, more obvious physical risks. An intervention study that included such education found reduced rates of having abusive partners 1 year following intervention (Baker et al., 2003).

Study Limitations and Strengths

The limitations of the present study bear mentioning. As is the case with virtually all studies of sexual behaviors, the measures of sexual behavior were based on self-reports, and self-reports of sensitive behaviors may be biased. However, prior research has indicated that self-reports are valid in carefully conducted studies (Fishbein & Pequegnat, 2000).

We took several recommended precautions, including the use of a data-collection technique (audio-assisted, self-administered computerized interviews) that is known to minimize self-report bias (Kobak, Greist, Jefferson, & Katzelnick, 1996; Lapham, Henley, & Kleyboecker, 1993; Lapham, Kring, & Skipper, 1991; Locke et al., 1992; Romer, Hornik, & Stanton, 1997); assurance to respondents that their data were confidential; and use of a field office in which men could complete their computerized interviews in privacy and out of sight of friends and relatives. The response rate (51%) was somewhat low, and we cannot assess the degree of bias, if any, introduced by nonresponders. Thus, we do not know the extent to which the results are
generalizable. Additionally, it should be noted that the wording for the construct of norm included a specific reason concerning the behavior: to avoid STDs. Hence, as measured, this construct captured only that specific aspect of normative influences, and not influences related to pregnancy, for example.

At the same time, our study has a number of strengths. We did not rely on a convenience sample. Thus, even with our lower response rate, our results are likely more generalizable than those of many other studies in this area. Our measures were carefully selected and pre-tested to ensure their reliability and validity. Although most studies have focused on condom use, we expanded our study to examine monogamy as another safer sex strategy and looked at condom use in the context of both steady partners and casual partners. The importance of this distinction is underscored by the fact that the best fitting models differed by behavior and partner type. We also examined the effect of pregnancy motivation on these safer sex behaviors. This is especially important because condom use is at odds with desires for pregnancy, and raises the question of how both motivations—that is, avoiding disease while trying for pregnancy—affect safer sex choices. Finally, we used prospective data to test two of the three models. Although that does not permit us to make strong causal claims, it represents an improvement over studies that have relied solely on cross-sectional data.

References


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* p < .05. ** p < .01. *** p < .001.
### Table A2

**Correlations Among Variables Used in Steady-Partner Condom Model**

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*Note. SP = steady partner.

*p < .05, **p < .01, ***p < .001.
Table A3

Correlations Among Variables Used in Casual-Partner Model

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*p < .05. **p < .01. ***p < .001.