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and Michael Hennessy¹**

Abstract

This study identifies a theoretical mechanism through which communication with friends about sex influences sexual initiation in a sample of adolescents. The *integrative model* was used to assess the effect of attitudes, normative pressure, and self-efficacy on intentions to have sex in a sample of virgin adolescents. Results show that the constructs of the theory partially mediated the effect of communication with friends on subsequent sexual initiation. The effect of communication with friends on sexual initiation was not different for male and female adolescents. Overall, the results suggest how conversations with friends about sex influence adolescents' intentions to initiate sexual intercourse, which in turn influence subsequent sexual initiation.

Keywords:

communication with friends, sexual initiation, adolescents, integrative model

There is evidence that psychosocial factors influence the sexual behavior of adolescents (Buhi & Goodson, 2007). In a review of the studies of the past decades, Kirby (2002) found that having older friends or having more permissive attitudes toward premarital sex were among the risk factors of sexual initiation. Social psychology has contributed to this body of evidence through research based on the theory of reasoned action (Fishbein & Ajzen, 1975) and its later versions, the theory of planned behavior (Ajzen, 1991) and the *integrative model* (Fishbein, 2000, 2007, 2008).

The theory of reasoned action assumes that behaviors under volitional control are predicted by the intention to engage in the behavior. Behavioral intention is predicted by two constructs: attitudes toward performing the specific behavior and subjective norms

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influencing the behavior (Fishbein & Ajzen, 1975). Recognizing that volitional control varies across behaviors, Ajzen (1991) proposed the theory of planned behavior, an extension of the theory of reasoned action that included perceived behavioral control as a third cognitive variable influencing both the formation of intentions and behavioral performance. The theory of planned behavior was later extended to explicitly recognize that skills and environmental factors may moderate the intention/behavior relationship and to acknowledge that normative pressure involves two sources of influence: injunctive and descriptive norms (Fishbein, 2007, 2008). Injunctive norms are the perceptions of what others think one should do, while descriptive norms are the perceptions of what others are doing (Cialdini, Reno, & Kallgren, 1990). Because his extension also explicitly considers the role of variables from other behavioral theories (e.g., perceived risk, emotion), this latest version of the reasoned action approach was called an integrative model (Ajzen, Albarracín, & Hornik, 2007; Fishbein, 2000, 2007, 2008; Fishbein & Yzer, 2003).

Several studies have used the reasoned action approach to predict sexual behaviors and behavioral intentions (e.g., Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Gillmore et al., 2002). These studies provide evidence for the theoretical power of cognitions to explain the formation of intentions and the enactment of behaviors. For example, a positive association between intentions to use condoms and actual condom use has been consistently reported (Albarracín et al., 2001; Bennett & Bozionelos, 2000). Associations between intentions and the antecedent cognitive variables of the integrative model are found using both cross-sectional and longitudinal studies. Attitudes and subjective norms have been found to be positively associated with intentions to have sex and to use condoms (Carvajal, Estrada, & Estrada, 2005; Flores, Tschann, & Marin, 2002; Gredig, Nideroest, & Parpan-Blaser, 2006; Koniak-Griffin, Lesser, Uman, & Nyamathi, 2003; Koniak-Griffin & Stein, 2006; Villarruel, Jemmott, Jemmott, & Ronis, 2004), and perceived behavioral control or self-efficacy has also been found to be associated with intentions to abstain from sex (Cha, Doswell, Kim, Charron-Prochownik, & Patrick, 2007) and with intentions to use condoms (Carvajal et al., 2005; Gredig et al., 2006; Koniak-Griffin et al., 2003; Koniak-Griffin & Stein, 2006; Villarruel et al., 2004).

Other Predictors of Sexual Behavior

Researchers looking at other predictors of sexual behavior have found that parental monitoring (e.g., Huebner & Howell, 2003) and friends' religiosity (e.g., Adamczyk & Felson, 2006; also see Regnerus, 2008) are negatively associated with adolescent's sexual behaviors but that friends' behavior is positively associated with the sexual behavior of the adolescent (e.g., Kirby, 2002; Magnani, Seiber, Zielinski Gutierrez, & Vereau, 2001; Romer et al., 1994). For example, Kirby (2002) suggests that teenagers appear to be more likely to have sex or to initiate sex when they think their peers are themselves having sex. This has been observed cross-sectionally (Magnani et al., 2001; Romer et al., 1994) and longitudinally (Kinsman, Romer, Furstenberg, & Schwarz, 1998; O'Donnell, Myint-U, O'Donnell, & Stueve, 2003; Stanton et al., 2002; Upadhyay & Hindin, 2006). Beyond perceptions of friends engaging in sex,

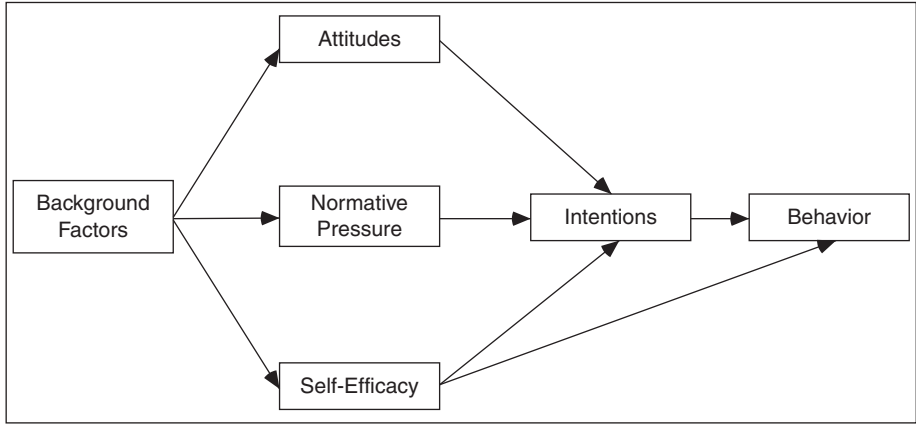


Figure 1. Generic model for the indirect effect of background factors on behavior in the context of the integrative model

other studies that use information about what friends actually do indicate that friends' behavior is positively associated with both adolescent's future sex (Maxwell, 2002) and delinquency behaviors (Haynie, 2001).

However, where do these other predictors of adolescent sexual behavior fit into the integrative model? First, in the context of the model, the perceived behavior of others is viewed as a measure of a descriptive normative belief, so perceptions of what friends are doing are expected to influence the behavior of adolescents. Second, and most relevant to the present study, the integrative model assumes that background factors, such as demographic and social characteristics, influence sexual behavior through their influence on the proximal predictors of intentions (Hennessy et al., 2009).

In the integrative model, background factors are assumed to shape the behavioral, normative, or control beliefs that respectively determine attitudes, perceived normative pressure, and self-efficacy, which in turn underlie the formation of intentions to engage in the behavior of interest (Fishbein, 2000, 2008). Figure 1 shows the generic model of how background factors fit into the model that predicts behavior.

The principle of sufficiency in the integrative model indicates that background factors predict intentions to perform any behavior through their effect on attitudes, perceived normative pressure, and self-efficacy (Ajzen & Albarracín, 2007). As such, a background factor should have a completely mediated effect on intentions through the attitudinal, normative, and self-efficacy components of the theory. It is possible, however, that a background factor may have an effect on behavior that is not completely mediated through intentions to perform the behavior. Thus, in the context of this article, a precursor of adolescent sexual behavior should have a completely mediated effect on intentions to have sex, but it may have an unmediated effect on sexual behavior.

In the domain of sexual behavior, there is some evidence that the effect of social variables on sexual behavior is mediated by the constructs of the integrative model. For

example, Hutchinson, Jemmott, Jemmott, Braverman, and Fong (2003) found that the effect of mother-daughter sexual risk communication on the outcome variable Number of Days of Unprotected Sexual Intercourse was mediated by self-efficacy. That is, greater mother-daughter sexual risk communication led to an adolescent's increased self-efficacy with respect to using condoms, which then reduced unprotected sex.

There is relatively little research on how communication with friends about sex influences adolescents' sexual initiation. Guzmán et al. (2003) found that adolescents' comfort about sex-based discussions with their friends was associated with intentions to delay intercourse. Besides this study, however, we were unable to find studies on how frequency of communication with friends about sex influences sexual initiation. The present study addresses this gap in the literature. By considering the constructs proposed by the integrative model, this study identifies the mechanism by which a social factor, the frequency of communication with friends about sex, increases the likelihood of initiating sex at a subsequent time through the adolescents' intentions to have sex.

Thus, consistent with research on the predictors of adolescent sexual behavior and the integrative model, we proposed the following hypothesis and two research questions:

Hypothesis 1: Communication with friends about sex will increase the likelihood of sexual initiation.

Research Question 1: Which integrative model constructs—attitudes, perceived normative pressure, or self-efficacy—mediate the effect of communication with friends about sex on subsequent sexual initiation?

Research Question 2: Is the effect of communication with friends about sex on subsequent sexual initiation completely mediated by the constructs of the integrative model?

Prior research has found that the precursors of adolescent sexual behavior may be different across gender groups (Fishbein & Ajzen, 1975; Rostosky, Regnerus, & Wright, 2003). For example, Porter, Oakley, Ronis, and Neal (1996) found that perceived negative consequences of having sex appeared to be more salient among female than male adolescents. This article also investigates whether communication with friends about sex differentially influenced sexual initiation for male and female adolescents. Thus, this study proposed the third research question:

Research Question 3: Is the effect of communication with friends on sexual initiation different for male and female adolescents?

In their analyses of the associations among perceptions of mothers' responsiveness in discussing sex, perceptions of peers' sexual activity, and delay of sexual initiation, Fasula and Miller (2006) found that mothers' responsiveness was positively associated with sexual delay among adolescents reporting high peer sexual activity, and they suggested that parent-child communication acts as a buffer for the effect of friends' behavior on intentions to initiate sex. In order to further explore this relationship, the present article will examine

the effect of parent-child communication about sex on sexual initiation in the context of the integrative model and, if necessary, the analyses conducted in this study will control for the effect of parent-child communications about sex.

This study focuses on a sample of adolescents who had not initiated sex at baseline. Three reasons guided the selection of this sample. First, by exploring a communication variable, this study is intended to contribute to the literature on initiation of sexual intercourse, which has found that intentions, perceived norms, and the environmental factor of being at home without a parent are consistent predictors of sexual initiation (Buhi & Goodson, 2007). Second, as sexual initiation is the end point of a trajectory in the adolescents' sexual behavior (McNeely et al., 2002), this study is proposed to understand one social factor—that is, sex-based communication with friends—that may contribute to this trajectory. Lastly, by selecting a sample of virgins, we would be able to rule out any possible influence of past behavior (i.e., having had sexual intercourse) on future behavior; thus, we would be able to make a causal inference about the influence of communication with friends on sexual behavior.

Method

The Annenberg Sex and Media Study

The Annenberg Sex and Media study is a longitudinal study investigating the influence of exposure to sexual content in the media on the sexual behavior of adolescents. Adolescents aged 14 to 16 were recruited in Philadelphia to complete an online survey in the spring of 2005 (baseline) and then again in the springs of 2006 and 2007. Most of the adolescents were recruited through advertisements placed in print and radio media. The recruiting process was guided by a quota sampling procedure, which aimed to sample equal numbers for race, gender, and age groups.¹ The IRB of the University of Pennsylvania approved the protocols of the study, and each respondent provided both written parental consent and personal assent before participating in the study.² Among other measures, the survey included items related to exposure to sexual content in the media, the respondent's own sexual behaviors, the constructs comprising the integrative model, and adolescents' interpersonal communication with parents and friends relating to sexual behavior. The analyses in this article are conducted using longitudinal data; the sample consists of the 316 adolescents who were virgins (i.e., had not had vaginal intercourse) at the first wave of the longitudinal study.

Measures

The outcome variable was sexual initiation at 1-year follow-up. From the 316 virgin adolescents at baseline, 19% ($n = 59$) initiated sex 1 year later.

The independent variables were all baseline measures. Intention to have sex was measured by averaging the following three items: "I am willing to have sexual intercourse in the next 12 months," "I will have sexual intercourse in the next 12 months," and "I intend to have sexual intercourse in the next 12 months," each with 7-response alternatives

ranging from *extremely unlikely* to *extremely likely*. Internal consistency of this scale was high ($\alpha = .92$, $M = 2.29$, $SD = 1.84$). The distribution of this variable was skewed with half of the sample in the lowest point of the scale (i.e., 50% reported that it was extremely unlikely that they would have sex in the next 12 months).

The measure of attitudes was created by averaging six bipolar semantic differential items: "My having sexual intercourse in the next 12 months would be [bad-good, foolish-wise, unpleasant-pleasant, not enjoyable-enjoyable, difficult-easy, harmful-beneficial]." Each item was scored on a 7-point scale with higher scores reflecting more positive attitudes. Internal consistency of this scale was high ($\alpha = .92$, $M = 3.31$, $SD = 1.79$). The measure of normative pressure was created by averaging items related to injunctive and descriptive norms. Injunctive norms were measured by the item "Most people who are important to me think I should not/should have sexual intercourse in the next 12 months," with 7-response alternatives ranging from *should not* to *should*. Descriptive norms were measured by the following items: "Most people like me will not/will have sexual intercourse in the next 12 months," with 7-response alternatives ranging from *will not* to *will*, and "Most people like me have not/have had sexual intercourse," with 7-response alternatives ranging from *have not* to *have*. Higher scores for the scale measuring norms reflected more perceived social pressure to have sex in the coming year ($\alpha = .74$, $M = 3.10$, $SD = 1.67$). One item was used for the measure of self-efficacy: "If I really wanted to, I am certain that I could not/could have sexual intercourse in the next 12 months," with 7-response alternatives ranging from *certain I could not* to *certain I could* ($M = 4.10$, $SD = 2.40$).

Communication with friends about sex was measured by averaging three items: "How often have your friends discussed the following with you: sexual behavior; risk of getting AIDS, HIV, or STDs; birth control," with response alternatives ranging from *never* (1) to *discussed many times in the past 12 months* (5).³ This variable measured the frequency of communication with friends about sex ($\alpha = .78$, $M = 3.14$, $SD = 1.18$). To control for the effect of parent-child communication on intentions to initiate sex, the variable communication with parents about sex was included in the analyses. This was measured by averaging the following three items: "How often has your parent/guardian discussed the following with you: sexual behavior; risk of getting AIDS, HIV, or STDs; birth control," with response alternatives ranging from *never* (1) to *discussed many times in the past 12 months* (5).⁴ Internal consistency of this scale was adequate ($\alpha = .84$, $M = 2.43$, $SD = 1.14$).

Statistical Analysis

A series of analytic steps were taken to test the hypothesis and to answer the three research questions. First, a *t* test was conducted to detect differences in communication with friends between genders; analysis of variance was used to detect differences in communication with friends within age and ethnic groups. Second, correlations were computed among the outcome and the six independent variables used in the analyses. Third, a bivariate logistic regression was conducted to test the hypothesis that communication with friends about sex increases the likelihood of subsequent sexual initiation.

Structural equation modeling was used to answer the first and second research questions. This analytical technique helps estimate the effects of background and mediator variables on an outcome variable of interest, in this case sex initiation (Kline, 2005; Schumacker & Lomax, 2004). The analyses were conducted using STATA 10.0 and Mplus version 5. Missing data are not a problem for the computation of the structural form coefficients; because Mplus uses an advanced form of maximum likelihood estimation (Enders & Bandalos, 2001), it can analyze data sets that include missing values. Missing cases were not greater than 3.5% listwise.

To answer the third research question, separate analyses were then conducted for male and female adolescents. Correlations were computed for each gender group. Then, bivariate logistic regressions of sex initiation on communication with friends were conducted for male and female adolescents. The SUEST command in STATA was used to test for gender difference of these estimated regression coefficients.

Results

Of the 316 virgin adolescents included in this sample, 38% were male participants, 52% were White, 37% were African American, 8% were Latino/Hispanic, and 3% reported Other races—that is, 1 Cambodian, 4 of mixed races, and 5 who did not specify their race. In addition, 40% were 14 years old, 32% were 15, and 28% were 16. Gender, but not age and race, differences were found in how frequently adolescents communicate with their friends about sex. Females talk more often with their peers about sex than do males ($M = 3.30$, $SD = 0.08$, and $M = 2.88$, $SD = 0.11$, respectively; $t(312) = -3.05$, $p < .01$). The overall F test for age differences in frequency of communication about sex was not significant, $F(2, 311) = 1.83$, $p = .16$, but post hoc comparisons showed that 14-year-olds communicated with friends about sex less ($M = 2.99$, $SD = 1.22$) than 16-year-old respondents ($M = 3.27$, $SD = 1.24$; $t(1) = 1.71$, $p = .09$).⁵ The overall F test for race differences in frequency of communication about sex was not significant, $F(3, 310) = 0.78$, $p = .51$, and post hoc comparisons did not reveal any difference among ethnic groups.

In order to assess the associations between the integrative model variables and the communication variables, correlations among all seven variables were computed and are shown in Table 1. Consistent with the integrative model, intentions show moderate-to-high associations with attitudes, normative pressure, self-efficacy, and sexual initiation. The measure for communication with friends shows low but significant positive correlations with attitudes, normative pressure, self-efficacy, and intentions, and a higher correlation with sex initiation and communication with parents. Communication with parents about sex was not significantly correlated with any of the integrative model constructs, but it was positively and significantly correlated with sex initiation. These results show that communication with friends about sex was associated with sexual initiation at 12-month follow-up ($r = .32$, $p < .01$). Communication with friends was positively associated with intentions to initiate sex in the next 12 months ($r = .19$, $p < .01$). Similarly, communication with friends was positively correlated with self-efficacy ($r = .21$, $p < .01$), with attitudes ($r = .20$,

Table 1. Zero-Order Correlations Between the IM Variables and Communication Variables

	Attitudes	Self-Efficacy	Normative Pressure	Intention	Sex Initiation ^a	Communication With Friends
1. Attitudes	—					
2. Self-efficacy	.50**	—				
3. Normative pressure	.61**	.46**	—			
4. Intention	.67**	.39**	.52**	—		
5. Sex initiation ^a	.33**	.22*	.30**	.26**	—	
6. Communication with friends	.20**	.21**	.19**	.19**	.32**	—
7. Communication with parents	-.00	-.02	.01	-.03	.20**	.35**

Note: $n = 305$ (missing cases were deleted listwise). IM = integrative model.

a. Polychoric correlations are reported for those pairs involving sex initiation. Sex initiation is measured at Time 2.

* $p < .05$. ** $p < .01$.

$p < .01$), and with normative pressure ($r = .19$, $p < .01$); yet these correlations were not significantly different from each other. A logistic bivariate regression showed that a one-point increase in the communication with friends scale was associated with a 56% increase in the odds of initiating sex ($OR = 1.56$, $SE = 0.21$, $p < .01$, Pseudo $R^2 = .04$). This result provides support for the hypothesis that communication with friends about sex increases the likelihood of sexual initiation at 1-year follow-up.

Mediation Analysis

Structural equation modeling was used to examine what integrative model constructs mediate the effect of communication with friends on sex initiation. The structural model included three exogenous variables: gender, age, and communication with friends. Because it was found that communication with friends about sex was influenced by gender but not ethnicity, the first was included as a dummy variable. In addition, since the literature indicates that age is positively associated with sexual initiation (Kirby, 2002), age was also included as dummy variables. The reference category for age was the group of 14-year olds, and the reference category for gender was the group of males. The model did not include parental communication about sex because it was not associated with any of the underlying constructs of the integrative model, and it was not necessary to control for its effects on behavior in the context of the integrative model. Figures 2 and 3 show the models that were used to examine the effect of communication with friends.

The structural form for the model showing complete mediation of the communication with friends variable on sexual initiation (Figure 2) has the following measures of fit: $\chi^2(7) = 11.847$, $p = .11$; root mean square error of approximation [RMSEA] = .047, Tucker-Lewis Index [TLI] = .953, comparative fit index [CFI] = .976. Overall, communication with friends shows an effect on subsequent sexual initiation that is mediated by attitudes

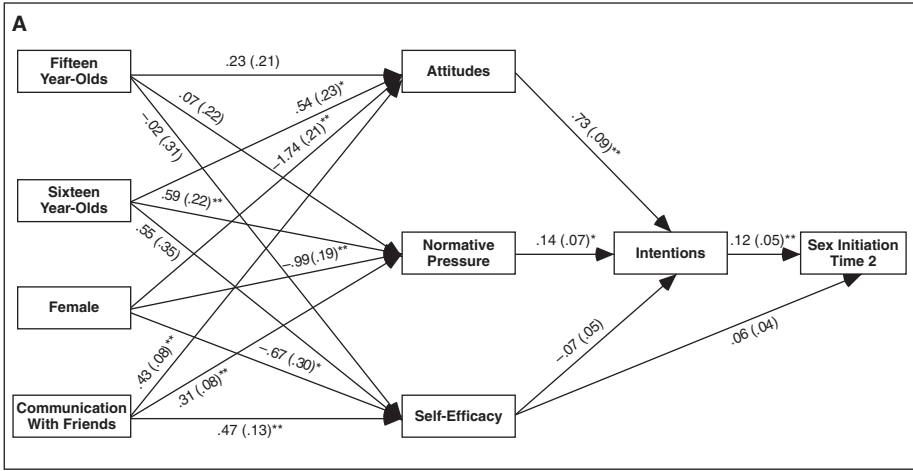


Figure 2a. The constructs of the integrative model mediate the effect of communication with friends on sex initiation

Structural model with unstandardized coefficients, and standard errors in parentheses, showing the influence of age, gender and communication with friends about sex on sexual initiation through the theoretical constructs of the integrative model.

Note: $\chi^2(7) = 11.847, p = .1057$; root mean square error of approximation = .047, Tucker-Lewis Index = .953, comparative fit index = .976, $n = 314$. Sex initiation is measured at Time 2.

* $p < .05$. ** $p < .01$.

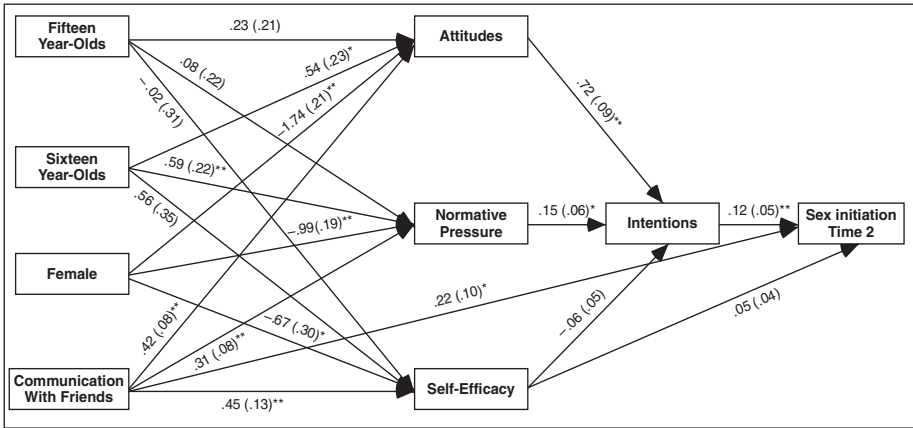


Figure 2b. The constructs of the integrative model partially mediate the effect of communication with friends on sex initiation: Communication with friends has a direct and indirect influence on sex initiation

Structural model with unstandardized coefficients showing the unmediated effect of communication with friends on sexual initiation. Also estimated in both models are the covariances of the exogenous variables and the errors of the endogenous variables, but these are not shown for clarity.

Note: $\chi^2(6) = 6.260, p = .3947$; root mean square error of approximation = .012, Tucker-Lewis Index = .997, comparative fit index = .999, $n = 314$. Sex initiation is measured at Time 2.

* $p < .05$. ** $p < .01$.

and normative pressure, which in turn influence intentions, which is the main predictor of sexual initiation. Communication with friends increased attitudes ($b = .43$, $SE = 0.08$, $p < .01$), normative pressure ($b = .31$, $SE = 0.08$, $p < .01$), and self-efficacy ($b = .47$, $SE = 0.13$, $p < .01$). Attitudes ($b = .73$, $SE = 0.09$, $p < .01$) and normative pressure ($b = .14$, $SE = 0.07$, $p < .05$), but not self-efficacy ($b = -.07$, $SE = 0.05$, $p = .17$), increased intentions to have sex. Intentions to have sex increased sexual initiation ($b = .12$, $SE = 0.05$, $p < .01$), but self-efficacy was unrelated to sexual initiation ($b = .06$, $SE = 0.04$, $p = .09$). The explained variance of the endogenous variables was the following: 28.6% for attitudes, 13.6% for perceived normative pressure, 7.8% for self-efficacy, 57.9% for intentions, and 9.5% for sex initiation.

To answer to the second research question, it is also necessary to show whether the effect of communication with friends on subsequent sexual initiation is fully or partially mediated by the constructs of the integrative model. Thus, a direct path linking communication with friends to sexual initiation was added to the prior model, and the fit of this model was estimated, $\chi^2(6) = 6.260$, $p = .39$; RMSEA = .012, TLI = .997, CFI = .999. The unmediated path of communication with friends about sex on sexual initiation was significant ($b = .22$, $SE = 0.10$, $p < .05$), which means that communication with friends also has a direct effect on sexual initiation. The explained variance of the endogenous variables was the following: 28.4% for attitudes, 13.6% for perceived normative pressure, 7.3% for self-efficacy, 57.4% for intentions, and 16.4% for sex initiation. Therefore, the answer to the second research question is that communication with friends about sex has an effect on sex initiation that is only partially mediated by the constructs of the integrative model.

Gender Differences

One additional research question was posed concerning gender differences, and the results showed that the effect of communication with friends about sex on sexual initiation is not different for male and female adolescents. Table 2 shows the correlations between the integrative model and communication variables separately for male and female adolescents.

Consistent with the integrative model, intentions were associated with attitudes, normative pressure, and self-efficacy, and with sex initiation in both gender groups. Communication with friends about sex was associated with all three proximal predictors of intentions (i.e., attitudes, norms, and self-efficacy) for female adolescents. For male adolescents, communication with friends about sex was significantly associated only with attitudes and self-efficacy; the association with normative pressure ($r = .15$, $p = .11$) was not significant.

Also consistent with expectations, communication with friends about sex was positively associated with sexual initiation for male ($r = .23$, $p < .05$) and female ($r = .42$, $p < .01$) adolescents, and with intentions to initiate sex for both male ($r = .34$, $p < .01$) and female ($r = .20$, $p < .01$) adolescents. Notice that the correlations between the communication scale and intentions in the case of both male and female adolescents are higher than the original correlation found between communication with friends and intentions in the

Table 2. Zero-Order Correlations Between the IM Variables and Communication Variables Separately for Male and Female Adolescents

	Attitudes	Self-Efficacy	Normative Pressure	Intention	Sex Initiation ^a	Communication With Friends	Communication With Parents
1. Attitudes	—						
2. Self-efficacy	.49**	.52**	.64**	.69**	.27*	.26**	-.10
3. Normative pressure	.54**	—	.53**	.50**	.18	.24**	-.03
4. Intention	.58**	.41**	—	.49**	.25*	.15	-.00
5. Sex initiation ^a	.33**	.30**	.48**	—	.25*	.34**	-.04
6. Communication with friends	.30**	.24*	.31**	.22*	—	.23*	.09
		.21**	.29**	.20**	.42**	—	.33**
7. Communication with parents	.09	-.00	.05	.03	.26**	.36**	—

Note: Correlations for boys ($n = 114$) are above the diagonal and for girls ($n = 191$) below the diagonal. Missing cases were deleted listwise. IM = integrative model.

a. Polychoric correlations are reported for those pairs involving sex initiation. Sex initiation is measured at Time 2.

* $p < .05$. ** $p < .01$.

full sample ($r = .19, p < .01$). This increase in the association between communication with friends and intentions is due to the differential effect of gender on intentions and communication with friends. While being a female adolescent is positively associated with communication with friends ($r = .22, p < .01$), it is negatively associated with intentions ($r = -.41, p < .01$). That is, female adolescents talk more often with their peers about sex than do male adolescents, but young men report higher intentions to have sex than do young women ($M = 3.10, SD = 0.19$ and $M = 1.80, SD = 0.11$, respectively; $t(312) = 6.48, p < .01$). Thus, gender suppresses the association between communication with friends and intentions to initiate sex. Separate bivariate logistic regressions for male and female adolescents predicting sex initiation from communication with friends about sex resulted in estimates (male adolescents: $OR = 1.31, SE = 0.25, p = .16$; female adolescents: $OR = 1.96, SE = 0.38, p < .01$) that were not significantly different from one another, $\chi^2(1) = 3.10, p = .08$.

Discussion

It was hypothesized that among virgin adolescents, frequent communication with their friends about sex will increase the likelihood of subsequent sexual initiation. This hypothesis was supported. All constructs suggested by the integrative model showed moderate-to-high bivariate associations with intentions to have sex, and intentions were predictive of sexual initiation. In the context of the integrative model, the influence of communicating with friends on sex initiation was partially mediated by the theoretical variables: In the structural model, communication with friends influenced sex initiation both directly and indirectly.

Having a direct and indirect effect of a background variable on sexual behavior has been reported in another longitudinal study with adolescents. When testing the sufficiency of the theory of planned behavior—the prior version of the integrative model—Beadnell et al. (2007) found that the perceptions of the number of friends having sex influenced subsequent sexual behavior both directly and indirectly through subjective norms and through intentions. While these authors relied on the argument that social network variables may operate on intentions outside attitudes, subjective norms, and self-efficacy, their finding is not surprising in light of the integrative model; in this model, the perception of the number of friends having sex is captured by descriptive norms, a component of the construct normative pressure. However, the direct effect of communication with friends on behavior—as we found it—suggests that background variables can operate on behavior outside the theoretical variables of the integrative model, which has been acknowledged in the literature (Hennessy et al., 2009).

Communication with friends also influenced attitudes, normative pressure, and self-efficacy. While attitudes and normative pressure significantly increased intentions to have sex in the next 12 months, self-efficacy and intentions were unrelated. In addition, only intentions were predictive of sex initiation. Self-efficacy was unrelated to sex initiation after controlling for intentions. Thus, the influence of communication with friends on the adolescents' sex initiation was partially mediated through its influence on attitudes and normative pressure. Finally, while female adolescents engaged in more frequent

discussions about sex than males, the effect of communication with friends on sexual initiation was not different across gender groups.

The results reported in this study are consistent with prior evidence suggesting that association with friends influences adolescent sexual initiation through the integrative model variables. Most previous studies reporting peer influence focused on descriptive norms, that is, on perceptions of the sexual behavior of friends (Magnani et al., 2001; Romer et al., 1994; Stanton et al., 2002; Upadhyay & Hindin, 2006); yet none of these studies assessed the effects of frequency of communication with friends about sex on perceived social pressure or on sexual initiation in a sample of adolescents. The present study has shown that for adolescents, frequency of communication with friends about sex increases attitudes, perceived norms, and self-efficacy toward having sex; yet only attitudes and norms increase their intentions to have sex, which is the main predictor of sex initiation.

Findings from this study are relevant to public health communication. Designers of health communication programs can take into account the specific effect of peer communication on the sexual initiation of adolescents. If the desired effect of a campaign is to delay adolescents' sexual initiation, campaigners need to be aware that adolescents who engage more frequently in discussions about sex with their friends may be more likely to initiate sex than those who engage less frequently in such discussions. However, in order to understand the true effect of these discussions, research is needed to identify the valence of the discussions, whether they are prosex or antisex. Huebner and Howell (2003) have called for the same focus in regards to parent-adolescent communication. The analyses reported here suggest that conversations with friends are prosex as they significantly increase the likelihood of sexual initiation.

Certainly, one problem we were unable to resolve is that girls talk more about sex than boys do, but at the same time their intentions to have sex are lower than those of boys. This may suggest that communication with friends about sex influences sexual initiation differently for boys and girls, but we found that communication with friends showed an effect on sex initiation that was not different for boys and girls. It might be that boys and girls use communication with friends to form intentions to have sex differently. Future studies should be designed to examine this possible difference. These studies, for example, can examine whether girls are more susceptible than boys to the influence of sex-based discussions with their peers, when forming intentions to have sex.

While there is research suggesting that perceptions of parent-child communications about sex have a positive effect on sexual delay (Fasula & Miller, 2006), the present study found that communication with parents about sex was positively associated with subsequent sexual initiation but unrelated to all the underlying constructs of the integrative model. These results do not support the assertion, suggested in the literature (Fasula & Miller, 2006), that parent-child communication about sex serves to reduce the formation of intentions to initiate sex among adolescents. It may well be that parents start talking with their children about sex when they suspect their children are about to have sex. In fact, results from Beadnell et al. (2007) may lead to this argument. Beadnell et al. (2007) found that the positive correlation between Year-6 sexual behavior and Year-7 parent-child communication about protecting from getting (someone) pregnant was significantly greater

than the positive correlation between Year-7 parent-child communication about protecting from getting (someone) pregnant and Year-6 sexual behavior.

This study also found a moderate and positive association between communication with parents and communication with friends about sex. Further research should capture how parent-adolescent communication and peer communication about sex influence each other. While this study found no relationship between parent-adolescent communication and intentions to initiate sex, communication with parents about sex may influence communication with friends about sex, which influences intentions to initiate.

One limitation of the study pertains to construct validity: Measures were collected from adolescents' self-report of their communication with their friends, which may not be an accurate estimate of the true interaction. Second, it might be important to learn how comfortable adolescents felt when discussing about sex, STDs, or pregnancy with their friends. This, however, was not captured in this study. Finally, because participants were recruited through advertisements and word of mouth in a single metropolitan area, generalizability of the results may be limited. In particular, because the majority of the sample was comprised of White and African American teenagers, inferences based on the results may not be relevant to all ethnic groups, such as Latinos/Hispanics or adolescents from Other races. Overall, though, this study sheds light on the role of conversations with friends about sex as a factor influencing the sexual behavior of adolescents as well as on the relationship between cognitive and social variables that have been viewed as influencing sexual initiation.

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Notes

1. Race groups were White, African American, and Hispanic. However, in Philadelphia there is a small Hispanic population, and Hispanics were difficult to recruit. There are thus fewer Hispanics than Whites or African Americans in the sample.
2. Respondents received US\$25 for completing the survey at each point in time, and those completing all three waves received a US\$25 bonus.
3. Response alternatives for this category were never/discussed—but not in the past 12 months/discussed once or twice in the past 12 months/discussed several times in the past 12 months/discussed many times in the past 12 months.

4. Response alternatives for this category were the same as those used for communication with friends.
5. Comparisons were conducted using the ANOVA CONTRAST command in STATA.

References

- Adamczyk, A., & Felson, J. (2006). Friends' religiosity and first sex. *Social Science Research, 35*, 924-947.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.
- Ajzen, I., & Albarracín, D. (2007). Predicting and changing behavior: A reasoned action approach. In I. Ajzen, D. Albarracín, & R. Hornik (Eds.), *Prediction and change of health behavior* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum.
- Ajzen, I., Albarracín, D., & Hornik, R. (Eds.) (2007). *Prediction and change of health behavior: Applying the reasoned action approach*. Mahwah, NJ: Lawrence Erlbaum.
- Albarracín, D., Johnson, B., Fishbein, M., & Muellerleile, P. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin, 127*, 142-161.
- Beadnell, A., Wildson, A., Wells, E., Morison, D., Gillmore, M., & Hoppe, M. (2007). Intrapersonal and interpersonal factors influencing adolescents' decisions about having sex: A test of the sufficiency of the theory of planned behavior. *Journal of Applied Social Psychology, 37*, 2840-2876.
- Bennett, P., & Bozonelos, G. (2000). The theory of planned behavior as predictor of condom use: A narrative review. *Psychology, Health & Medicine, 5*, 307-326.
- Buhi, E., & Goodson, P. (2007). Predictors of adolescent sexual behavior and intention: A theory-guided systematic review. *Journal of Adolescent Health, 40*, 4-21.
- Carvajal, S., Estrada, A., & Estrada, B. (2005). Longitudinal prediction of unprotected sex in predominantly Latino male IDUs. *Journal of Applied Biobehavioral Research, 10*, 133-148.
- Cha, E., Doswell, W., Kim, K., Charron-Prochownik, D., & Patrick, T. (2007). Evaluating the theory of planned behavior to explain intention to engage in premarital sex amongst Korean college students: A questionnaire survey. *International Journal of Nursing Studies, 44*, 1147-1157.
- Cialdini, R., Reno, R., & Kallgren, C. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015-1026.
- Enders, C., & Bandalos, C. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8*, 430-457.
- Fasula, A., & Miller, K. (2006). African-American and Hispanic adolescents' intentions to delay first intercourse: Parental communication as a buffer for sexually active peers. *Journal of Adolescent Health, 38*, 193-200.
- Fishbein, M. (2000). The role of theory in HIV prevention. *Aids Care, 12*, 273-278.
- Fishbein, M. (2007). A reasoned action approach: Some issues, questions, and clarifications. In I. Ajzen, D. Albarracín, & R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum.
- Fishbein, M. (2008). A reasoned action approach to health promotion. *Medical Decision Making, 28*, 834-844.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fishbein, M., & Yzer, M. (2003). Using theory to design effective health behavior interventions. *Communication Theory, 13* 164-183.

- Flores, E., Tschann, J., & Marin, B. (2002). Latina adolescents: Predicting intentions to have sex. *Adolescence*, 37, 659-679.
- Gillmore, M., Archibald, M., Morrison, D., Wildson, A., Wells, E., & Hoppe, M., et al. (2002). Teen sexual behavior: Applicability of the theory of reasoned action. *Journal of Marriage and Family*, 64, 885-897.
- Gredig, D., Nideroest, S., & Parpan-Blaser, A. (2006). HIV-protection through condom use: Testing the theory of planned behaviour in a community sample of heterosexual men in a high-income country. *Psychology and Health*, 21, 541-555.
- Guzmán, B., Schlehofer-Sutton, M., Villanueva, C., Dello Stritto, M., Casad, B., & Feria, A. (2003). Let's talk about sex: How comfortable discussions about sex impact teen sexual behavior. *Journal of Health Communication*, 8, 583-598.
- Haynie, D. (2001). Delinquent peers revisited: Does network structure matter? *American Journal of Sociology*, 106, 1013-1057.
- Hennessy, M., Bleakley, A., Fishbein, M., Brown, L., DiClemente, R., Romer, D., Venable, P., Carey, M., & Salazar, L. (2009). Differentiating between precursor and control variables when analyzing reasoned action theories. *AIDS and Behavior*, Prepublished April 16, 2009; DOI 10.1007/s10461-009-9560-z
- Huebner, A., & Howell, L. (2003). Examining the relationship between adolescent sexual risk-taking and perceptions of monitoring, communication, and parenting styles. *Journal of Adolescent Health*, 33, 71-78.
- Hutchinson, K., Jemmott, J., Jemmott, L., Braverman, P., & Fong, G. (2003). The role of mother-daughter sexual risk communication in reducing sexual risk behaviors among urban adolescent females: A prospective study. *Journal of Adolescent Health*, 33, 98-107.
- Kinsman, S., Romer, D., Furstenberg, F., & Schwarz, D. (1998). Early sexual initiation: The role of peer norms. *Pediatrics*, 102, 1185-1192.
- Kirby, D. (2002). Antecedents of adolescent initiation of sex, contraceptive use, and pregnancy. *American Journal of Health Behavior*, 26, 473-485.
- Kline, R. (2005). *Principles and practice of structural equation modeling*. New York: Guilford.
- Koniak-Griffin, D., Lesser, J., Uman, G., & Nyamathi, A. (2003). Teen pregnancy, motherhood, and unprotected sexual activity. *Research in Nursing and Health*, 26, 4-19.
- Koniak-Griffin, D., & Stein, J. (2006). Predictors of sexual risk behaviors among adolescent mothers in a human immunodeficiency virus prevention program. *Journal of Adolescent Health*, 38, 297 e1-297 e11.
- Magnani, R., Seiber, E., Zielinski Gutierrez, E., & Vereau, D. (2001). Correlates of sexual activity and condom use among secondary-school students in urban Peru. *Studies in Family Planning*, 32(1), 53-66.
- Maxwell, K. (2002). Friends: The role of peer influence across adolescent risk behaviors. *Journal of Youth and Adolescent*, 31, 267-277.
- McNeely, C., Shew, M., Beuhring, T., Sieving, R., Miller, B., & Blum, R. (2002). Mother's influence on the timing of first sex among 14- and 15-year-olds. *Journal of Adolescent Health*, 31, 256-265.
- O'Donnell, L., Myint-U, A., O'Donnell, C., & Stueve, A. (2003). Long-term influence of sexual norms and attitudes on timing of sexual initiation among urban minority youth. *Journal of School Health*, 73(2), 68-75.
- Porter, C., Oakley, D., Ronis, D., & Neal, W. (1996). Pathways of influence on fifth and eighth graders' reports about having had sexual intercourse. *Research in Nursing and Health*, 19, 193-204.
- Regnerus, M. (2008). *Forbidden fruit: Sex and religion in the lives of American teenagers*. Oxford, UK: Oxford University Press.
- Romer, D., Black, M., Izabel, R., Feigelman, S., Kaljee, L., & Galbraith, J., et al. (1994). Social influences on the sexual behavior of youth at risk for HIV exposure. *American Journal of Public Health*, 84, 977-985.

- Rostosky, S., Regnerus, M., & Wright, M. (2003). Coital debut: The role of religiosity and sex attitudes in the Add Health survey. *Journal of Sex Research, 40*, 358-367.
- Schumacher, R., & Lomax, R. (2004). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum.
- Stanton, B., Li, X., Pack, R., Cottrell, L., Harris, C., & Burns, J. (2002). Longitudinal influence of perceptions of peer and parental factors on African American adolescent risk involvement. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 79*, 536-548.
- Upadhyay, U., & Hindin, M. (2006). Do perceptions of friends' behaviors affect age at first sex? Evidence from Cebu, Philippines. *Journal of Adolescent Health, 39*, 570-577.
- Villarruel, A., Jemmott, J., Jemmot, L., & Ronis, D. (2004). Predictors of sexual intercourse and condom use intentions among Spanish-Dominant Latino youth: A test of the planned behavior theory. *Nursing Research, 53*, 172-181.

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