



## Original article

# Psychosocial Predictors of Human Papillomavirus Vaccination Intentions for Young Women 18 to 26: Religiosity, Morality, Promiscuity, and Cancer Worry



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## ABSTRACT

**Objectives:** To determine whether five psychosocial variables, namely, religiosity, morality, perceived promiscuity, cancer worry frequency, and cancer worry severity, predict young women's intentions to receive the human papillomavirus (HPV) vaccination.

**Methods:** Female undergraduate students ( $n = 408$ ) completed an online survey. Questions pertaining to hypothesized predictors were analyzed through bivariate correlations and hierarchical regression equations. Regressions examined whether the five psychosocial variables of interest predicted intentions to vaccinate above and beyond controls. Proposed interactions among predictor variables were also tested.

**Results:** Study findings supported cancer worry as a direct predictor of HPV vaccination intention, and religiosity and sexual experience as moderators of the relationship between concerns of promiscuity reputation and intentions to vaccinate. One dimension of cancer worry (severity) emerged as a particularly robust predictor for this population.

**Conclusions:** This study provides support for several important, yet understudied, factors contributing to HPV vaccination intentions among college-aged women: cancer worry severity and religiosity. Future research should continue to assess the predictive contributions of these variables and evaluate how messages and campaigns to increase HPV vaccination uptake can utilize religious involvement and worry about cancer to promote more effectively HPV vaccination as a cancer prevention strategy.

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The human papillomavirus (HPV) is the most common sexually transmitted infection in the United States, with over 14 million new infections each year (Centers for Disease Control and Prevention, 2013a). HPV infection is a precursor to cervical cancer in women. In the United States alone, 4,000 women die from this disease each year, and approximately 12,000 new cases of cervical cancer are diagnosed (Centers for Disease Control and Prevention, 2014a). In the past decade, two vaccines approved by

the U.S. Food and Drug Administration (Gardasil in 2006 and Cervarix in 2009) have become available to immunize against strains of HPV that can lead to cervical cancer (Garland & Smith, 2010). Despite public health recommendations for vaccination as a primary cancer prevention strategy for females aged 9 to 26, the HPV vaccine has been underutilized by young adult women (Centers for Disease Control and Prevention, 2013b; see also Markowitz et al., 2012).

Early research investigated demographic factors predicting HPV vaccination (e.g., age, race, and health insurance status; Brewer & Fazekas, 2007). As data on vaccine uptake have emerged, attention has shifted to psychosocial predictors of and barriers to vaccination behaviors (e.g., Holman, Benard, Roland, Watson, Liddon, & Stokley, 2014). Theoretical behavioral models suggest several psychosocial predictors of HPV vaccination. For example, the Health Belief Model posits that as the

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perceived likelihood of contracting HPV and perceived vaccine effectiveness increase, individuals are more likely to report vaccine acceptability (Brewer & Fazekas, 2007). Additional research has focused on identifying barriers that parents encounter to the vaccine, such as concerns about vaccination safety or concerns about promoting sexual activity (Holman et al., 2014). Although this research enhances understanding of vaccine barriers, further work is necessary to understand fully the facilitation of vaccination uptake.

One limitation of the existing literature is that psychosocial research has primarily focused on samples of parents concerning vaccination for their adolescent children (Holman et al., 2013). The vaccine is most effective when administered before individuals engage in sexual activity, and thus, the Advisory Council on Immunization Practices recommends vaccination for girls 11 or 12 years old to maximize the preventive benefits (Centers for Disease Control and Prevention, 2014). Given this relatively young age range, some parents have been resistant to obtaining the vaccine for their daughters, citing moral concerns about increasing sexual activity and vaccine safety (Constantine & Jerman, 2007). As a result of these social concerns and other barriers to vaccination (Holman et al., 2013), many girls and young women remain unvaccinated, and vaccination rates remain well below public health utilization targets (Centers for Disease Control and Prevention, 2014). Less is known about when and why young adults (18–26) engage in HPV vaccination, and this population presents a second target group for HPV prevention. Although studies of parents have uncovered some promising predictors, this population is inherently different from young adults, suggesting psychosocial variables may not function in the same ways.

Substantial research links HPV and the HPV vaccine with social and moral concerns prevalent in parents' and young women's considerations toward cervical cancer prevention (e.g., Holman et al., 2013). Studies of the HPV vaccine informed by the theories such as the Health Belief Model have also illustrated the role that these types of perceived barriers can play in limiting uptake of this health behavior (Brewer & Fazekas, 2007). However, past studies have failed to characterize the complexities of the relationships among health beliefs, moral beliefs, and social perceptions among young women, families, peers, and communities that may support or hinder personal decisions about sexual activities and the HPV vaccine. Research that investigates the influence of participation in religious organizations, moral stances surrounding sexual behavior, concerns about promiscuous reputations among peer groups can shed light on why young women choose to get vaccinated. Therefore, the present study investigates several key understudied psychosocial factors likely to influence HPV vaccination intentions of young adult women in particular: religiosity, sexual morality, perceived promiscuity, and cancer worry frequency and severity. Ultimately, extending understanding of how and why psychosocial variables influence vaccination can aid efforts to increase adherence for this cancer prevention behavior.

## Psychosocial Predictors

### Religiosity

Religiosity is broadly defined as one's participation in organized religious practices involving worship of a higher power (Miller & Thoresen, 2003). Religiosity has been found to correlate

with young women's health knowledge, intentions, and behaviors (e.g., Gerend & Shepherd, 2011).

Currently, findings about the relationship between religiosity and HPV vaccination are inconclusive (Barnack, Reddy, & Swain, 2010; Brewer & Fazekas, 2007; Liddon, Leichter, & Markowitz, 2012). Religiosity may positively influence health by regulating lifestyles and behaviors, providing social support, and promoting positive self-perceptions (Ellison & Levin, 1998). For instance, Patel and colleagues (2012) found college-aged women who believed their religious organizations would approve of the vaccine were more likely to report positive vaccination intentions. In contrast, Constantine and Jerman (2007) found greater acceptance of the HPV vaccine among parents who report rarely or never attending religious services, and lower levels of acceptance among those reporting no religious affiliation or affiliation with a born-again or evangelical Christian church, and parents who reported attending religious services more than one per week.

One concern about these mixed findings has been the limitation posed by single-item measures of the religiosity construct. Many previous studies have used a single question, such as "How often do you attend religious or spiritual services?", to evaluate the influence of religious participation on health behavior. To address this concern, the present study employs a more robust, 10-item religiosity scale encompassing a more comprehensive conceptualization of religiosity (Plante & Bocaccini, 1997). It includes items that measure both the importance of religious beliefs (e.g., "My faith is an important part of who I am as a person") and participation in organized religious practice (e.g., "I consider myself active in my faith and church"). This scale has been shown to be both a reliable and valid measure of religiosity for use across a diverse range of religious affiliations (Plante & Bocaccini, 1997). Given the inconsistency of previous findings and the lack of sufficient past measurement, we pose the following research question:

RQ1: Will religiosity predict young adult women's intentions to vaccinate for HPV?

### Sexual Morality and Perceived Promiscuity

One looming barrier is the perception that vaccination will encourage sexual behavior (Brewer & Fazekas, 2007). Parents with greater concerns about their children's sexual activity are less likely to intend to vaccinate them (Brewer & Fazekas, 2007). For example, in a statewide survey of California parents, Constantine and Jerman (2007) found a relatively high acceptance rate of the HPV vaccine for daughters. However, parents who were not willing to vaccinate their daughters expressed concerns about the effect of the vaccine on sexual behavior. Specifically, these parents noted concerns about the potential to increase sexual behavior as well as moral concerns associated with such sexual activity.

Given these concerns, many adolescents fail to receive the HPV vaccine. As a result, young women aged 18 to 26 constitute an important "catch up" group for the HPV vaccine. Hilpert, Carrion, Brem, Ciani, and Ciani (2010) note that moral beliefs may play also a role in HPV prevention for this age group: "Young adults who place a high value on abstaining from premarital sex or believe premarital sex to be immoral may face cognitive and affective challenges to learning about sexual health" (p. 44). However, less is known specifically about how perceptions of sexual behavior and the HPV vaccine may influence intentions of

young adults. Hence, the present study examines whether young women experience their own concerns about potentially stigmatizing moral perceptions associated with the HPV vaccine.

Stigma is a theoretical construct, defined by the social judgment and disgrace of marked individuals, which may explain the influence of social perceptions on health behaviors (Smith, 2007). Two sources of stigma may be social concerns about perceptions of sexual morality and promiscuity associated with HPV vaccination. Sexual morality consists of one's moral beliefs about sexual behavior. For individuals holding moral beliefs that sexual activity should not occur during teenage years or outside of a monogamous relationship, the HPV vaccine may draw concerns about how one's sexual activity is perceived. Sexual morality measures the degree to which individuals view sexual activities and outcomes as moral or immoral, with items such as "Premarital sex is an immoral act" and "People who contract sexually transmitted infections engage in immoral activities." This barrier to vaccination is well-documented in the literature on parents considering the HPV vaccine for daughters. In a systematic review, Holman and colleagues (2013) found that across studies, an estimated 1% to 18% of parents express concern that the HPV vaccine could promote sexual activity or condone this behavior for adolescent girls.

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Perceived promiscuity is related to sexual morality and is one's concern about being perceived as engaging in promiscuous, transient, or risky sexual activities. Strong commitment to moral beliefs about sexual activity has negatively predicted intentions to engage in sexual behavior (Constantine & Jerman, 2007). Individuals expressing greater levels of concern about perceived promiscuity respond positively to statements, including "Other people might think I'm promiscuous if I get vaccinated for HPV" and "If I get the HPV vaccine, people will think I don't practice safe sex." For those with greater concerns about violating moral beliefs or about perceptions of promiscuity, behaviors that counter beliefs or raise concerns would be particularly stigmatizing.

H1: Sexual morality will negatively predict intention, such that those with greater sexual morality concerns will be less likely to intend to vaccinate.

H2: Perceived promiscuity will negatively predict intention, such that those with greater promiscuity concerns will be less likely to vaccinate.

#### Cancer Worry

Cancer worry is distinct from general dispositional worry, and entails the ongoing cognitive activity of engaging in negative

thoughts about cancer, independent of specific contexts like a doctor's appointment (Andersen, Drescher, Zheng, Bowen, & Wilson, 2007). Cancer worry has two basic dimensions: cancer worry frequency (how often one worries about cancer) and cancer worry severity (the magnitude of those worries; Jensen, Bernat, Davis, & Yale, 2010). A growing body of research has identified cancer worry as a predictor of cancer-related behaviors (Jensen et al., 2010), yet no work has examined the role of cancer worry in HPV vaccination intentions among young women.

A focal point of the current study is to understand when and why cancer worry is related to HPV vaccination as a cancer prevention behavior (McCaul & Goetz, 2007). The extended parallel process model (Witte, 1994) may be useful in explaining how and why cancer worry influences vaccination. The model posits that successful health behaviors emerge when perceived threats are paired with sufficient efficacy to combat them. Cancer worry may heighten the perception of a threat to one's health. Paired with recommendation for the vaccine, messages that stimulate cancer worry may be effective in promoting the vaccine as a response to combat such worry. Therefore, the dimensions of cancer worry may prove to be valuable predictors of intentions to vaccinate.

H3: Cancer worry severity (H3a) and cancer worry frequency (H3b) will positively predict HPV vaccination intention, such that those with greater severity and frequency of cancer worry will be more likely to intend to vaccinate.

#### Psychosocial Variable Interactions

It is plausible that one or more hypothesized predictors do not directly influence vaccination intention, but instead moderate the impact of other psychosocial variables on intentions. As individuals consider whether to vaccinate, they evaluate potential social responses to this behavior. Two potential moderators—religiosity and sexual experience—may shape social perceptions associated with vaccination. In other words, religiosity may moderate the effect of social variables, such as sexual morality or perceived promiscuity, on vaccination intention.

Sexual activity also holds potential as a moderator of morality, perceived promiscuity, religiosity, and/or cancer worry on intention. Previous research has found that women who have already received the HPV vaccination were more likely to be sexually active (Ziemer & Hoffman, 2013).

RQ2: Does religiosity moderate the relationship between intention to vaccinate and morality (RQ2a), perceived promiscuity (RQ2b), cancer worry frequency (RQ2c), and cancer worry severity (RQ2d)?

RQ3: Does sexual activity moderate the relationship between intention to vaccinate and religiosity (RQ3a), morality (RQ3b), perceived promiscuity (RQ3c), cancer worry frequency (RQ3d), and cancer worry severity (RQ3e)?

#### Methods

All participants were recruited through an online research participation system managed by the Department of Communication. To participate, students had to be enrolled in a communication class; however, the sample represents students from across campus, because at least one communication class is required for most majors. Participants completed a survey in

exchange for 1% extra credit. Procedures were approved and monitored by a university institutional review board.

The initial sample included 1,086 undergraduate females. Only participants within the approved age range for the vaccine and who had not initiated the vaccination series were included in the current analysis ( $n = 408$ ).

The average age of the sample was 20 years old ( $SD = 1.57$ ; range, 18–26). Approximately 56% of participants had engaged in sexual intercourse in the past ( $n = 228$ ). Half of the participants had received a flu shot previously (50.7%;  $n = 207$ ). In all, 71.2% of participants were Caucasian ( $n = 314$ ), 15.7% Asian ( $n = 70$ ), 6.3% African American ( $n = 28$ ), 2.5% Latino ( $n = 11$ ), and 4.3% identified as other ( $n = 19$ ). African-American women in this sample were more likely to report higher intentions regarding HPV vaccination than others, which is inconsistent with a recent national survey on young adult HPV vaccination rates (Caskey, Lindau, & Alexander, 2009). Thus, race was included all analyses as a covariate.

## Measures

### Previous vaccination behavior

Flu vaccination is a health behavior that could explain variance in HPV vaccination. Therefore, two single-item measures determined whether participants had already begun the HPV vaccination series (to determine eligibility for the study), and whether they had received a flu shot in the past (responses were coded as 0 [no] or 1 [yes]).

### Sexual experience

HPV can be transmitted through various sexual or intimate activities that involve skin-to-skin contact. Additionally, sexual behavior may be interpreted as a variety of activities by individuals based on their past experiences. Thus, a four-item scale assessed whether participants had engaged in prior sexual behavior in four different manners: sexual intercourse, oral sex, touching someone's genitals, and being with someone in an intimate or sexual way, using a dichotomous scale (0 [no], 1 [yes]). Mean scores closer to 1 on this scale indicated more comprehensive sexual experience ( $M = 0.64$ ;  $SD = 0.43$ ; Cronbach's  $\alpha = 0.93$ ).

### Religiosity

Ten items drawn from Plante and Boccaccini (1997) assessed religiosity. Item responses used a four point scale anchored with strongly disagree and strongly agree ( $M = 2.79$ ;  $SD = 0.98$ ; Cronbach's  $\alpha = 0.97$ ).

### Sexual morality

Four items from Hilpert and colleagues (2010) assessed personal perceptions about the morality of sexual behaviors. Responses used a 6-point scale anchored with strongly disagree to strongly agree ( $M = 2.28$ ;  $SD = 1.19$ ; Cronbach's  $\alpha = 0.83$ ).

### Perceived promiscuity

Twelve items measured concerns about perceived promiscuity and HPV vaccination using a 7-point scale anchored with strongly disagree to strongly agree. A principle axis factor analysis revealed two underlying factors. Four items focused on concerns that getting the HPV vaccine would lead individuals to engage in riskier sexual behavior ( $M = 2.65$ ;  $SD = 1.53$ ; Cronbach's  $\alpha = 0.93$ ). This variable was labeled promiscuity—risk. Four items focused on concerns that getting the

HPV vaccine would damage an individual's reputation ( $M = 3.63$ ;  $SD = 1.68$ ; Cronbach's  $\alpha = 0.94$ ). This variable was labeled promiscuity—reputation.

### Cancer worry

Eight items from Jensen and colleagues (2010) were used to assess the severity and frequency dimensions of cancer worry (four items per dimension). Participants responded using a 7-point scale anchored with not at all to often. Both cancer worry—severity ( $M = 4.92$ ;  $SD = 1.48$ ; Cronbach's  $\alpha = 0.88$ ) and cancer worry—frequency ( $M = 1.62$ ;  $SD = 1.04$ ; Cronbach's  $\alpha = 0.83$ ) were reliable.

### Vaccination intention

Participants answered, "I intend to begin the vaccinations in the next 6 months" by using a 7-point scale anchored with strongly disagree to strongly agree ( $M = 2.94$ ;  $SD = 1.87$ ).

## Results

Bivariate correlations were calculated to examine the relationships among variables. Five variables were significantly related to intentions to initiate HPV vaccination at the 95% confidence level: religiosity, promiscuity—reputation, cancer worry—severity, cancer worry—frequency, and past sexual behavior (Table 1). Religiosity and promiscuity—reputation were negatively related to intention such that those who were more religious and those with greater concerns about reputation damage were less likely to vaccinate. Cancer worry—severity and cancer worry—frequency were positively related to intention; worriers were more likely to intend to initiate the HPV vaccine process. Sexual experience was positively related to HPV vaccination intentions, such that sexually active participants were more likely to intend to vaccinate.

Older participants were more likely to be sexually active; younger participants were more likely to have concerns about sexual morality, promiscuity—reputation, and promiscuity—risk. Those who were sexually active were less likely to have those same concerns, though they were more likely to report cancer worry—severity.

H1 through 3b and RQ1 postulated that five psychosocial variables (religiosity, sexual morality, promiscuity—reputation/risk, cancer worry—severity, and cancer worry—frequency) would predict HPV vaccination intentions, above and beyond traditional sociodemographic predictors. To test these hypotheses, a hierarchical linear regression was carried out with known predictors in the first block as control variables (age, sexual behavior, flu vaccination behavior, and race); religiosity, sexual morality, and promiscuity—reputation/risk in the second block; and cancer worry—severity and cancer worry—frequency in the third block. The regression was significant at the third block:  $r = 0.36$ ,  $R^2 = 0.13$ ,  $F(10, 385) = 5.61$ ,  $p < .001$  (Table 2). Only two variables were significantly related to HPV vaccinations intentions: cancer worry—severity and cancer worry—frequency. Combined, cancer worry—severity and cancer worry—frequency predicted approximately 10% of the variance in HPV vaccination intentions. Those with greater cancer worry, both in terms of severity and frequency, were more likely to intend to vaccinate.

RQ2a-d and RQ3a-e asked if there were any interactions between the psychosocial predictors, sexual behavior, and religiosity. To explore this possibility, a fourth block containing these interactions was added to the hierarchical regression. This block

**Table 1**  
Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Intention	1										
2. Age	.045	1									
3. Sexual behavior	.111*	.242**	1								
4. Flu vaccination	.041	-.178**	-.039	1							
5. Race	-.069	-.099	-.035	.016	1						
6. Religiosity	-.097*	-.004	-.182**	-.031	-.184**	1					
7. Sexual morality	-.074	-.126*	-.354**	.011	.026	.401**	1				
8. Promiscuity - reputation	-.107*	-.136**	-.138**	-.014	.102*	.153**	.226**	1			
9. Promiscuity - risk	-.094	-.134**	-.188**	-.002	.118*	.182**	.299**	.436**	1		
10. CW - severity	.306**	.028	.213**	.020	-.081	.005	-.114*	-.008	-.089	1	
11. CW - frequency	.191**	.070	.052	-.080	-.060	.020	.060	.075	.046	.267**	1

Abbreviation: CW, cancer worry.  
\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

was also significant,  $r = 0.41$ ,  $R^2 = 0.16$ ,  $F(17, 385) = 4.237$ ,  $p < .001$ . Two interactions were significant: promiscuity—reputation  $\times$  religiosity interaction (Figure 1) and promiscuity—reputation  $\times$  past sexual behavior (Figure 2). To understand the magnitude of the interactions, the hierarchical regression was rerun with only these two interaction terms in the fourth block:  $r = 0.39$ ,  $R^2 = 0.15$ ,  $F(12, 385) = 5.64$ ,  $p < .001$ . Combined, the two interactions explained approximately 2.3% additional variance in intentions, above and beyond the other predictors.

To better understand the nature of these relationships, the interactions were probed at three levels of the moderator (the mean and  $\pm 1$  SD) using PROCESS, a conditional process modeling program (Hayes, 2012). Each interaction was plotted and its Johnson–Neyman significance region(s) examined (Hayes & Mathes, 2009). Approximately 42% of young women reported high degrees of religious involvement (religiosity score > 3.15). For religious young women, increased concern about being perceived as promiscuous reduced intentions to vaccinate. Concern about a perceived promiscuous reputation also reduced intentions to vaccinate for women with more comprehensive sexual experience, or approximately 54% of the sample (a mean sexual experience score of 0.7876 or higher). Together, these findings emphasize common concerns about social perceptions associated with the HPV vaccine that may

ultimately reduce uptake of this prevention behavior among young women.

**Discussion**

Past research on HPV vaccination has focused on a limited range of demographic and psychosocial variables (Brewer & Fazekas, 2007) impacting young women in the upper age range of vaccine eligibility (i.e., 18–26). The current study tests understudied psychosocial predictors of HPV vaccination intentions (religiosity, morality, promiscuity, and cancer worry) in this understudied, but important, target group. Findings supported cancer worry as a direct predictor of HPV vaccination intention, and religiosity and sexual experience as moderators of the relationship between concerns of promiscuity reputation and intentions to vaccinate.

The study offers two relatively new predictors of HPV vaccination intentions: cancer worry frequency and cancer worry severity. In particular, cancer worry severity is a robust predictor of vaccination intentions. Cancer worry has been shown to be related to perceived risk, indicating that cancer worry may predict intentions by increasing perceived susceptibility to HPV and/or cervical cancer. In turn, perceived susceptibility may increase acceptability of HPV vaccination (Brewer & Fazekas, 2007). This relationship will be particularly important to track in prevention efforts among young adults, for whom perceived susceptibility to delayed health outcomes, such as cancer, may be low. Overall, these findings suggest the need for more research to better understand cancer worry as a construct.

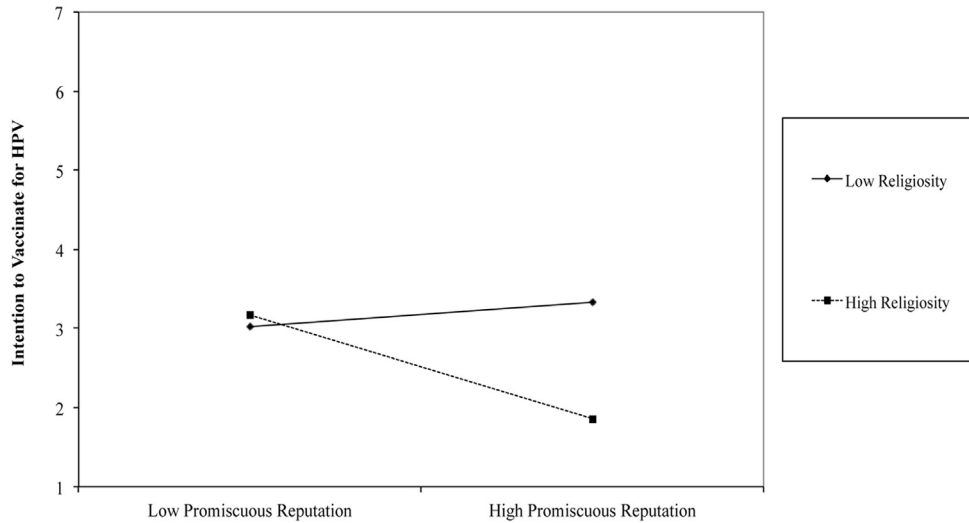
The present study also sheds light on the role of religious involvement in HPV vaccination behavior. Specifically, religiosity may offer more predictive power as a moderator of the relationship between reputation concerns and vaccination intentions. Concerns about a promiscuous reputation are heightened for young women with greater religious involvement, and they are less likely to vaccinate under these conditions. Interventions designed to address these social concerns may be an effective way to increase vaccination intentions for these individuals.

Third, the results illustrate the moderating effect of sexual experience on perceptions of promiscuity as a barrier to HPV vaccination. Young women with more comprehensive sexual experiences are more likely to intend to get the HPV vaccine if they do not express concern about being perceived as promiscuous. Put another way, the HPV vaccine may serve as a marker of sexual stigma for some sexually active women, which is

**Table 2**  
Hierarchical Regression Predicting Intentions to Receive the HPV Vaccine

Variables	$\beta$	$\Delta R^2$
Block 1		0.02
Age	0.02	
Sexual behavior	0.91	
Flu vaccination behavior	0.15	
African American	-.31	
Block 2		0.01
Religiosity	-.13	
Sexual morality	-.01	
Promiscuity - reputation	-.07	
Promiscuity - risky	-.03	
Block 3		0.10***
Cancer worry - severity	0.34***	
Cancer worry - frequency	0.22*	
Block 4		0.02**
Promiscuity - reputation $\times$ religiosity	-.14*	
Promiscuity - reputation $\times$ sexual behavior	-.32*	

Note. Standardized betas and  $R^2$  change are listed at each block.  
\**p* < .05; \*\*\**p* < .001.



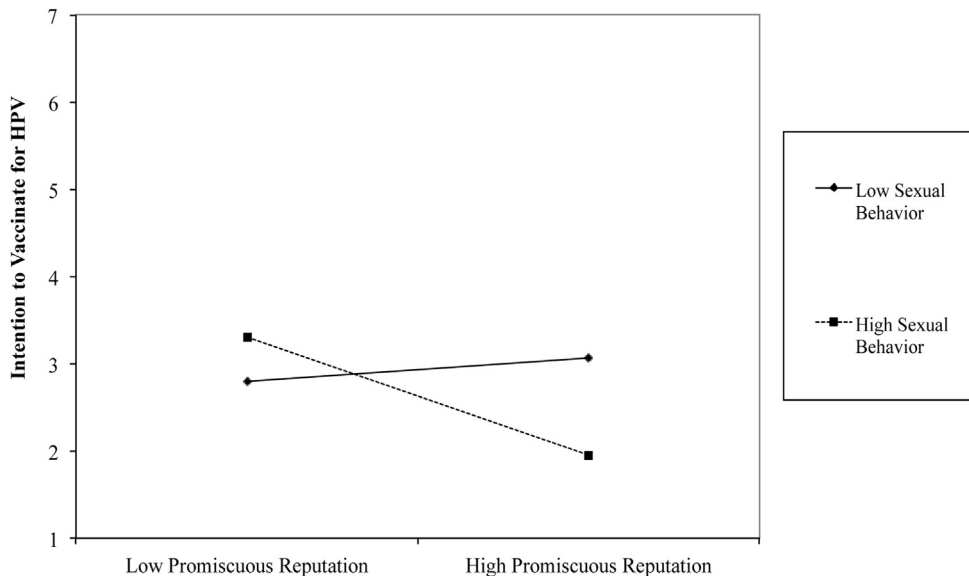
**Figure 1.** Interaction between perceived promiscuity—reputation and religiosity. Those with higher religiosity scores were less likely to intend to vaccinate due to concerns about perceived promiscuity—reputation concerns.

particularly concerning because women engaging in sexual behaviors are most likely to benefit from the vaccine.

The present study is not without limitations. First, the sample included young women from one university, and therefore may not represent the breadth of religious beliefs present in the general population. Future studies might broaden recruitment to more fully represent the diversity of religious beliefs. Second, the study focused on young adult women who have not yet vaccinated for HPV, but does not examine differences between women who have and have not received the vaccination. Future research should conduct comparative analyses to identify demographic differences between these groups. Additionally, the HPV vaccine is approved by the U.S. Food and Drug Administration for both women and men. Researchers should also continue to examine the effect of psychosocial predictors on young men’s intentions to vaccinate (e.g., Gerend & Barley, 2009), as these variables may influence men in different ways.

**Implications for Policy and/or Practice**

Despite these limitations, the study suggests promising new directions for interventions to prevent cervical cancer. First, the present study suggests that cancer worry may provide a new avenue for health practitioners seeking to increase perceptions of susceptibility to HPV and cervical cancer among young adults. It is likely that some young adults do not experience significant worry about delayed health outcomes, including cervical cancer. Future campaigns might increase emphasis on the connection between HPV and development of cervical cancer, or focus on the severity of cervical cancer for young women to boost concern about this health issue. By addressing the dimensions of cancer worry in public health messages, practitioners may be able to increase the degree to which young adults perceive themselves as at risk and draw increased attention to vaccination as a prevention measure.



**Figure 2.** Interaction between perceived promiscuity—reputation and sexual experience. Those with higher sexual experience scores were less likely to intend to vaccinate due to concerns about perceived promiscuity—reputation concerns.

Second, the present study identified religiosity as a potential moderator of vaccination behavior, suggesting the utility of incorporating consideration of religious beliefs and/or community practices into cervical cancer prevention approaches among young adults. Past research has demonstrated the utility of church-based interventions for health promotion across a variety of health contexts (Campbell et al., 2007). Future health campaigns might focus on faith-based interventions targeting promiscuity reputation concerns and HPV vaccination for young adult women or develop targeted interventions for young adults within a church or religious community.

Finally, the study highlights the role that social perceptions about sexual promiscuity may serve as an obstacle to the HPV vaccine for some sexually active young women. Health practitioners seeking to promote the HPV vaccine should consider how educational interventions can work to distinguish the vaccine as a healthy, cancer prevention behavior from a source of sexual stigma for young women.

## Conclusion

Approved less than a decade ago, HPV vaccination is a relatively new health behavior recommended for young adults. From the start, researchers have been eager to develop strategies to promote and predict vaccination adherence as a primary cervical cancer prevention tactic. The findings of this study extend the existing literature on cervical cancer prevention behavior (Brewer & Fazekas, 2007; Holman, et al., 2014) by offering two new psychosocial tools for predicting vaccination above and beyond sociodemographics. As the variables identified in this study continue to be investigated in future research, a more comprehensive picture of when and why young women engage in HPV vaccination for cervical cancer prevention behavior will continue to emerge.

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