Broken Promises:

Virginity Pledge Breach and Health[*]

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ABSTRACT

Prior research on the effects of virginity pledging has largely neglected the phenomenon of pledge breaches. Abstinence expectations are broken when respondents have partners who are nonexclusive or when they themselves engage in premarital sex. Drawing on the National Longitudinal Study of Adolescent Health, we examine whether associations between pledging and three health outcomes – intimate partner violence perpetration (IPV) among men and out-of-wedlock pregnancy and sexually transmitted infections among women – depend on nonexclusivity by partners and the sexual histories of respondents, respectively. The results indicate that male pledgers are significantly more likely to perpetrate IPV if their partners are nonexclusive. We also found a positive interaction between pledging and sexual history among female respondents, suggesting higher risks of out-of-wedlock pregnancies and sexually transmitted infections for pledgers, compared to nonpledgers with similar sexual histories. The results show that there are unintended negative consequences of abstinence beliefs.

Due, in part, to the combined efforts of conservative Christian denominations, abstinence-only sex education (AOSE) programs in schools, and the virginity-pledge movement, beliefs about remaining sexually abstinent prior to marriage are common among U.S. teens.[1] In 2002, more than 2.3 million 15-19 year olds, roughly one of out eight teenagers, reported taking a pledge to remain abstinent until marriage (Abma, Martinez, Mosher, et al. 2004), and the primary reason cited for not engaging in sexual intercourse among sexually abstinent teenagers was that it was "against religion or morals" (Martinez, Copen, and Abma 2011, p. 11). Because one of the central claims of AOSE advocates is that abstinence programs delay the onset of sexual activity, it is not surprising that the scholarly debate has centered on the efficacy of these types of programs (Trenholm, Devaney, Fortson et al. 2007; Underhill, Montgomery, and Operario 2007) and virginity pledges (Bearman and Brückner 2001; Martino, Elliott, Collins, et al. 2008; Rosenbaum 2009) in delaying the initiation of first intercourse.[2] The majority of pledge takers, however, end up being "pledge breakers," eventually engaging in premarital sex (Brückner and Bearman 2005). Although several studies have examined the impact of pledge breaking for contraceptive use, sexually transmitted infections, and out-of-wedlock pregnancies (Adamczyk and Felson 2008; Bearman and Brückner 2001; Brückner and Bearman 2005; Martino et al. 2008; Rosenbaum 2009), none directly compare pledge breakers and nonpledgers on these outcomes with similar sexual histories.

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[1] During the administration of George W. Bush, federal spending on various abstinence-only grants and programs nearly tripled, from $73 million in 2001 to $191 million in 2009 (U.S. Department of Health and Human Services 2009).

[2] There is also a vigorous policy debate. Both conservative think tanks (Rector and Johnson 2004) and the second Bush administration argued that abstinence-only sexual education programs delayed the onset of first intercourse by promoting the "social, psychological, and health gains [of] abstaining from sexual activity" (Government Accountability Office 2006). For a review of the political debate surrounding the use of federal funding for abstinence-only education programs, see *The Content of Federally Funded Abstinence-Only Education Programs*, a report prepared for Rep. Henry Waxman, by the United States House of Representatives Committee on Government Reform—Minority Staff Special Investigations Division.

To fill this gap, we examine the conditions under which breaches of abstinence beliefs are linked to increased risk of negative sexual and reproductive health outcomes. Abstinence programming generally promotes three specific beliefs: (1) the importance of abstaining from sex until marriage; (2) the ineffectiveness of contraceptives; and (3) a "biblical" conception of marriage (Uecker 2008). Consequently, this research focuses on those experiencing breaches of these expectations—that is, pledge takers who engaged in premarital sex and who had nonexclusive sex partners. We argue that pledgers exposed to either of these two situations, compared to similar nonpledgers, are at greater risk of negative outcomes, such as sexually transmitted infections and out-of-wedlock pregnancies, in the first case, and the perpetration of intimate partner violence, in the second.

To make this link, we adapt the notion of the psychological contract (Robinson 1996) to the case of sexual exclusivity expectations and show that their violation within intimate relationships can lead to strong emotional, and at times violent, responses among pledgers. We also draw on Swidler's (1986) notion of "cultural lag" and propose that abstinence beliefs have a long lasting, potentially negative effect on individuals who fail to live up to their promises regarding sexual self-restraint. Specifically, the cultural lag model contends that individuals find it difficult to abandon familiar strategies of action contained within their cultural repertoire even when the underlying cultural values associated with those strategies are not longer relevant to the individual (Swidler 1986). In the case of breached abstinence beliefs, individuals may reject the values underlying the abstinence-only movement by engaging in sexual intercourse outside of marriage, but fail to adapt new scripts and repertoires associated with safe-sex practices. Below, we test our arguments empirically by examining how breaches of abstinence beliefs, such as premarital sex and nonexclusivity, interact with virginity pledging to impact sexual and

reproductive outcomes, as well as the possibility of violence within a relationship where a breach has occurred.

Prior research

Research linking abstinence beliefs to sexual and reproductive health largely focus on the importance of religion, AOSE programs, and virginity pledging. First, a number of studies have consistently found positive associations between religiosity and sexual behavior, including later sexual debut among adolescents (Jones et al. 2005; Hardy and Raffaelli 2003; Meier 2003; Brewster et al. 1998; Ku, Sonenstein, and Pleck 1993; Sheeran et al. 1003; Beck, Cole, and Hammond 1991; Thornton and Camburn 1989), fewer sex partners (Jones et al. 2005; Miller and Gur 2002; Billy, Brewster, and Grady 1994; Thornton and Camburn 1989), and lower risk of out-of-wedlock pregnancy (Jones et al. 2005). Conservative religious sects, such as Roman Catholics, Evangelical Protestants, and Mormons, are also more likely to delay first sex and have fewer premarital sex partners (Bearman & Brückner 1999; Brewster, Cooksey, Guilkey et al. 1998; Cooksey, Rindfuss, and Guilkey 1996; Regnerus 2007; Uecker 2008). In contrast, research on the relationship between religiosity or service attendance and contraceptive use is mixed, with studies finding that religious adolescents are both more (Jones et al. 2005; Miller and Gur 2002) and less (Thompson 1982) consistent users of contraceptives, while others report no association with contraceptive use (Bearman and Brückner 2001; Zelnik, Kanter, and Ford 1981). Thus, given the myriad of both positive and negative findings, the importance of religiosity for sexual and reproductive health outcomes is unclear.

Scholars have also studied the consequences of abstinence-only sex education (AOSE) programs. Systematic reviews of randomized and quasi-randomized controlled studies have found no protective effects of abstinence-only programs for the onset of first sexual intercourse

(Trenholm et al. 2007; Underhill et al. 2007). Furthermore, there was some evidence that AOSE programs have adverse effects on sexual and reproductive health in terms of increased risk of STD acquisition and out-of-wedlock pregnancies (Underhill et al. 2007). In contrast, comprehensive (also known as "abstinence plus") sex education, which includes instruction on safe sex practices as a compliment to abstinence-only instruction, has been shown to generate protective effects and few adverse outcomes (Underhill, Operario, and Montgomery 2007, but see Sabia 2006).

Finally, a number of studies have evaluated the importance of virginity pledging for sexual and reproductive outcomes. Adolescents who took virginity pledges were more likely to delay sexual involvement, marry earlier, have fewer premarital sex partners, and were less likely to have nonexclusive partners (Bearman and Brückner 2001; Brückner and Bearman 2005; Meier 2007; Uecker 2008; for a review, see Santelli, Ott, Lyon et al. 2006). Notably, Bearman and Brückner (2001) found a sizable pledge effect, reporting that adolescents who took virginity pledges delayed sex, but that the effects depended on the proportion of peers in schools taking the pledge as well.

The efficacy of formal pledging has come into question, however. What may really matter is not the formal pledge itself, but a commitment to beliefs about abstinence (Bersamin, Walker, Waiters et al. 2005). The pledge effect may simply be an artifact of selectivity—that is, individuals predisposed to delaying sex, such as those with pre-existing abstinence beliefs, may be more likely to pledge. Rosenbaum (2009), for example, found while utilizing propensity-scoring techniques that virginity pledgers were just as likely to have premarital sex, STDs, and engage in other oral and anal sex. In contrast, Martino et al. (2008) found that pledges were effective, at least among adolescents who had relatively low risk of becoming sexually active.

Taken together, these studies suggest that a formal pledge may be associated with delayed first intercourse, but it is likely a proxy for underlying abstinence beliefs. In terms of sexual and reproductive health, the findings about pledging are similar to those for religiosity and AOSE. Several studies indicate that pledgers were less likely to use contraceptives at their first (Bearman and Brückner 2001) and most recent occurrence of sexual intercourse (Rosenbaum 2009), while others found that pledgers were as likely as nonpledgers to be consistent condom users (Martino et al. 2008). Additionally, other studies found that virginity pledges did not reduce the likelihood of contracting STDs (Brückner and Bearman 2005; Rosenbaum 2009) and the occurrence of out-of-wedlock pregnancy (Adamczyk and Felson 2008), controlling for the number of prior sex partners. The findings from Adamczyk and Felson (2008), in particular, show that pledgers had lower risks of out-of-wedlock pregnancies, but this effect was mediated by sexual history, suggesting that the protective effect of pledging is primarily indirect through reduced sexual risk-taking behaviors (i.e., early first intercourse and more premarital sex partners). To summarize, the extant literature suggests that religiosity and pledging are associated consistently with delayed first intercourse, fewer sex partners, and monogamy, but quasi-experimental studies of AOSE programs and propensity-scoring techniques for observational data on pledging raise serious questions about whether observed associations are simply artifacts of self-selection and other forms of unobserved heterogeneity (e.g., pre-existing abstinence beliefs).

There are two empirical shortcomings in the literature. First, although the question of whether religiosity, AOSE, and pledging are causally related to delayed sex is an important policy question, this debate obscures the significance of abstinence beliefs for sexual and reproductive health. Certainly, individuals may express their beliefs about abstinence through

religion and virginity pledging—that is, they may signal their beliefs through religious service attendance or by taking the pledge. We argue that the more relevant questions center on the actual effects of abstinence beliefs on sexual and reproductive health. Second, the presence of abstinence beliefs, as indicated by religiosity, exposure to AOSE programs, or virginity pledging, does not appear to be protective with respect to consistent condom use, sexually transmitted infections, and out-of-wedlock pregnancies. This pattern of findings suggests that abstinence beliefs might be associated with lower health risks and the reduced propensity to engage in sexual risk-taking behaviors, but also higher risks for negative sexual and reproductive health when risky sexual behavior occurs. To date, however, no research has assessed whether pledgers have higher risks of STD acquisition and out-of-wedlock pregnancies, compared to nonpledgers with similar patterns of sexual behavior. Finally, we expand our attention to the significance of beliefs of fidelity in marriage. As we demonstrated above, beliefs about marriage are a central to the virginity pledge, but its significance has been neglected in research on sexual and reproductive health. In sum, therefore, we seek to address these issues by examining whether pledgers do indeed have higher risks for sexually transmitted infections and out-of-wedlock pregnancies while also extending the outcomes to include intimate partner violence, which is arguably a key outcome linked to abstinence beliefs.

Conceptual approach

We draw on cultural approaches to sexuality to develop theoretical expectations between abstinence beliefs and sexual and reproductive health. Since the introduction of Swidler's (1986) "tool-kit" conception of culture, it has become a truism that culture matters. Researchers have sought to advance the field in a number of ways, including, among others, arguing for the

importance of cognition (e.g., Vaisey 2009), the interplay between culture and structure (for a review, see Pachucki and Breiger 2010), the effects of cultural heterogeneity (e.g., Harding 2007), and patterns of cultural persistence (e.g., Kirk and Papachristos 2011; Tavory and Swidler 2009). A vast majority of researchers in this area have tended to focus on consistency between cultural beliefs and motives, and subsequent repertoires and behavior (e.g., Harding 2007; Vaisey 2009). In contrast, the issue of disjunctures between cultural meanings and social action, which has been historically central to cultural anthropology, often receives little attention. In this research, we suggest that pledge breach is an important case study for examining how breaches of cultural meanings, as opposed to cultural consistency, affect social action.

This last point is of particular interest for our research, as well as being a central concern for Swidler (1986). The issue of cultural persistence highlights how skills, habits, repertoires, and strategies for action are causal for maintaining patterns of behavior in the absence of the ideas or beliefs that originally motivated them. Importantly, it not only suggests a conception of culture as a set of skills or repertoires, but also directs attention to the social contexts under which cultural persistence occurs. For example, Tavory and Swidler (2009) show that cultural meanings attributed to condom use cause individuals to refrain from condom use, even if they are at-risk for acquiring human immunodeficiency virus (HIV).

In the context of pledge breaking, we argue that individuals are slow to adapt their scripting of sexual behavior interactions after breach and fall back on their current repertoires and strategies for action. For example, we believe that sexually active pledge breakers will continue to engage the previously enacted scripts obtained through abstinence only education, virginity pledging, and the like, and therefore will be less likely to become proactive about managing their sexual and reproductive health risks by seeking out condoms and other forms of

contraception or discussing these issues with their sex partners and friends. Because abstinence beliefs are typically associated with increased distrust about the efficacy of contraceptives, we also argue that pledgers, compared to nonpledgers with the same amount of sexual experience, will have increased risks of STD acquisition and out-of-wedlock pregnancies, both of which directly result from inconsistent contraceptive use. This suggests that pledge breakers will be less likely to use condoms consistently as they transition from adolescence to adulthood, putting them at increased risk of contracting sexually transmitted infections and out-of-wedlock pregnancies. This suggests the following hypotheses:

H1: Pledge breakers will have higher risks of out-of-wedlock conceptions, compared to nonpledgers with similar levels of sexual experience.

H2: Pledge breakers will have higher risks of STDs, compared to nonpledgers with similar levels of sexual experience.

We also argue that the cognitive schemas of abstinence beliefs matter. Because abstinence beliefs are intertwined with fidelity expectations in marriage, it represents a distinct psychological contract where individuals invest heavily in the idea of sexual exclusivity. According to theories of "psychological contracts," a perceptual contract emerges when an individual believes that his or her behavior or contributions within a relationship obligates the other party to reciprocate in kind (Rousseau 1989). This phenomenon, it should be stressed, is more than mere expectations, as psychological contracts entail beliefs about entitlements that are perceived to arise from implied promises made by the other party (Robinson 1996). Perhaps most importantly, breaches of psychological contracts go beyond dissatisfaction. Rather, perceived or actual violations can result in feelings of betrayal and deep psychological distress, loss of control, anger, injustice, and moral outrage (Rousseau 1989).

The psychological contract of virginity pledging invokes strong expectations about the sexual fidelity of not only the pledgers, but also their partners. In partnerships based on a foundation of pledging—regardless of whether the partner actually engages in virginity pledging or not—each member of the couple is expected to espouse the virtues imbued in the pledge. As such, we expect that pledgers will be particularly at risk of experiencing sharp negative emotions, such as jealousy, betrayal, and anger when their partners fail to live up to the tenets of their agreement and are nonexclusive. Research on jealousy in intimate relationships show strong associations with the occurrence of intimate partner violence (Paik, Laumann, and Van Haitsma 2004; Giordano et al. 2010) and lower relationship quality (Gatzeva and Paik 2011), which suggests the following hypothesis:

H3: Pledge breakers, compared to nonpledgers, will have higher risks of IPV perpetration if their partners are nonexclusive.

As cultural objects, abstinence beliefs become tools for adolescents that can "identify problems and assign blame, provide solutions or strategies, and provide rationale for engaging in action" (Harding 2007:346; see also Goffman 1974). Currently, most studies investigate the associations between abstinence beliefs and various health outcomes in an effort to examine the causal role played by these cultural objects. This research program, however, does not consider the consequences of pledge breach, such as when adolescents or their partners break their promises. In this research, we examine how breaches of these abstinence beliefs, such as premarital sex and nonexclusivity, interact with virginity pledging and jointly impact out-of-wedlock pregnancies, STDs, and the perpetration of intimate partner violence (IPV).

METHODS

Data were drawn from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative, longitudinal study of adolescents, originally in grades 7-12, with 4 waves of data collection (1994-2008). In 1994 and 1995, the Wave I, in-home survey was administered, consisting of interviews with 20,745 adolescents (79 percent response rate) while in Wave III, 15,197 respondents were reinterviewed in 2001-2002 (76 percent response rate). Wave IV, administered in 2007 and 2008, reinterviewed 15,701 of the original Wave I respondents (80 percent response rate).

Our analyses utilized several analytical samples. The first analytical sample focused on IPV perpetration by men against their female partners. We chose Wave III male respondents, of which 4,461 had responses on key variables for both Wave I and Wave III and were asked about recent sexual or important sexual relationships. We then focused on all sexual relationships of these men with women, which resulted in 6,530 dyads. Second, for our analyses of out-of-wedlock pregnancy, we focused on sexually active women who had valid responses on variables from Wave I and Wave III (n=5,302). Finally, for the analysis of STDs, we focused on Wave III and Wave IV outcomes. The Wave III analysis consisted of 3,266 sexually active women who had valid biomarker data for human papillomavirus (HPV) as well as valid responses on other relevant variables from Waves I and III. Because HPV is quite prevalent, easily spread, and not treatable, we believe that it is a good measure for an individual's cumulative exposure to STDs because of inconsistent condom use. Finally, we examined self-reported measures of STD experience at Wave IV. There were 6,389 sexually active women at Wave IV who also had valid data for other variables at Wave I and Wave III.

Dependent measures

Perpetration of IPV. Wave III included items from the revised Conflict Tactics Scale. We constructed a binary measure indicating the perpetration of (i) threats of physical violence, pushing or shoving, or throwing objects that could hurt; (ii) slapping, hitting, or kicking; and/or (iii) fighting that resulted in injury in respondents' most recent, important partnership during the prior year.

Out-of-wedlock pregnancy. We assessed whether female respondents experienced a premarital pregnancy between Waves I and III.

STDs. HPV status was based on biomarker data, which was collected at Wave III. At Wave IV, respondents reported whether they had ever been diagnosed with a STD.

Independent measures

Virginity pledge. We assessed virginity pledging based on responses to items in both Wave I or Wave III.

Number of prior sex partners. Respondents reported the number of sex partners from Waves I and Wave III.

Nonexclusivity of partners. At Wave III, respondents were asked whether their partners had other sex partners during their relationship.

Controls. We controlled for a number of demographic and personal characteristics, including age, parent's education (in years), family structure, grade point average at Wave I, race/ethnicity, educational attainment (in years) at Wave III, public assistance at Wave III, fighting in the prior 12 months at Wave I, religiosity at Wave I, religious affiliation at Wave I, age of sexual debut, which was reported at Wave III, and depression at Wave I. For the IPV

analyses, we also included a number partnership characteristics, including relationship duration, age difference (in years), a dummy for interracial relationships, education difference (in years), marital status, and how many years elapsed since Wave I to the start of the relationship.

Models

To examine the effects of virginity pledging on IPV perpetration in sexual relationships for our first sample of Wave III males, we utilized generalized estimating equation (GEE) logits to account for the nesting of dyads within male respondents. Next, for our second sample, we utilized standard logistic regressions of ever having an out-of-wedlock pregnancy among sexually active female respondents at Wave III (n=5,302). Finally, for our third sample, we estimated logistic regression models of HPV status at Wave III and ever being diagnosed with an STD at Wave IV.

RESULTS

IPV perpetration

Our first analyses examine associations among pledging, nonexclusive sex partners, and IPV perpetration by male respondents. Unweighted descriptive statistics are presented in Table 1. The average male respondent examined in this first analysis was white, approximately 16 years old at Wave I, came from a two parent, high school educated household, reported a high school GPA of slightly above a 2.6, and was affiliated with a protestant Christian religious denomination. In addition, over 43 percent of the male respondents reported that they had engaged in a physical fight within the past twelve months at Wave I. At Wave III, these male respondents reported on several aspects of their sexual relationships, indicating that the average

relationship did not entail marriage or cohabitation, was with a member of the same race, lasted nearly two years, and involved a slightly younger and less educated female partner.

[Table 1 about here]

Table 2 presents cross-tabulations of our two variables of interest, pledging and nonexclusive sex partners, and our outcome variable, IPV perpetration. In general, there is a strong association between the nonexclusivity of sex partners and IPV perpetration. Among respondents who had sexually exclusive partners, 12 percent perpetrated IPV against their partners. In contrast, 22 percent of male respondents who had nonexclusive partners perpetrated IPV against their female partners. Beyond the association between exclusivity and IPV, Table 2 also demonstrates a striking relationship among pledging, nonexclusivity, and the perpetration of IPV. Among respondents with sexually exclusive partners, there is no pledge effect on IPV perpetration. In contrast, nearly half of respondents who pledged and had nonexclusive partners perpetrated IPV against their partners, a nearly 115 percent increase compared to nonpledgers who also experienced nonexclusivity within a sexual relationship.

[Table 2 about here]

Table 3 examines this association in a multivariate model. It presents log-odds coefficients from GEE models of IPV perpetration by male respondents on virginity pledging, having a nonexclusive partner, and controls. Model 1 indicates that respondents with nonexclusive partners had more than two times the odds ($e^{0.74}$) of perpetrating IPV in the last year, compared with exclusive partners, but virginity pledging was not a significant predictor. Model 2 indicates a significant interaction between virginity pledging and concurrency, which indicates that the odds of IPV perpetration increased by a factor of 5.36 ($e^{(1.07+0.66-0.05)}$), or nearly 436 percent. Model 3 includes controls, indicating that these basic associations hold net of

socio-demographic, personal, and partnership characteristics. Nonpledgers with nonexclusive partners had more than one and a half times the odds of perpetrating IPV compared to nonpledgers with exclusive partners ($e^{0.49}$). As demonstrated by the interaction term, however, pledgers with nonexclusive partners had still approximately five times the odds of committing IPV perpetration ($e^{(1.27+0.49-0.11)}$) compared to nonpledgers with exclusive partners, while controlling for all of the other covariates in the model. Taken together, these results indicate male pledgers are at higher risk for IPV perpetration when their sexual partners are nonexclusive. It is also interesting to note that age and increasing levels of parental education act as protective factors in the odds of perpetrating IPV, while relationship duration, indications of high levels of relationship investment (e.g., cohabitation or marriage), and, not surprisingly, past instances of non-IPV related violence, are associated with increased odds of IPV perpetration. Most importantly, however, the finding with regards to exclusivity, virginity pledging, and IPV is consistent with Hypothesis 3.

[Table 3 about here]

Out-of-wedlock pregnancies

Our second analysis focuses on the relationship between pledging, sexual histories, and out-of-wedlock pregnancy. As indicated by the unweighted descriptive statistics in Table 1, the average female in our second sample is white, lives with her two parents, has high-school educated parents, is a high school graduate herself, and is affiliated with a protestant Christian denomination. With regards to sexual history, on average, the females in our sample first engaged in sexual intercourse at age 16 and a half, and reports between two and five sexual partners by Wave III.

Table 4 examines associations among pledging, sexual histories, and out-of-wedlock pregnancies. This table indicates that overall, a slightly lower percentage of pledgers (34 percent) had an out-of-wedlock pregnancy when compared to nonpledgers (38 percent). This association, however, depends on the number of prior sex partners among both pledgers and nonpledgers. For both groups, the prevalence of out-of-wedlock pregnancy increases as the number of sexual partners increases. Among pledgers, however, there is a significant jump once an individual reports having 11 or more sex partners. Compared to nonpledgers, who see an increase in the prevalence of out-of-wedlock pregnancy of about 5 percent when moving from the "6-10" category to the "11 or more" category, among pledgers the increase is nearly 67 percent (from a prevalence of 39.8 percent to over 66 percent in these two categories).

[Table 4 about here]

We next examined this association using logistic regression in Table 5. Model 1 shows that virginity pledging, while statistically significant, is associated with lower odds of out-of-wedlock pregnancy, net of controls. Model 2 indicates that differences in sexual histories between pledgers and nonpledgers appear to explain the finding in Model 1. That is, the bivariate association of lower odds among pledgers reflects their tendency to have fewer sex partners. Further, Model 2 indicates how each additional categorical increase in the number of sex partners is associated with increasing odds of out-of-wedlock pregnancy compared to individuals with only a single sex partner. While Model 3 fails to confirm an association between pledging, sexual history, and out-of-wedlock pregnancy, when the control variables are added in Model 4, this relationship becomes significant among respondents who indicated that they had 11 or more sexual partners. Specifically, among pledgers in this group, the odds of out-of-wedlock pregnancy increase by a factor of 2.17, or approximately 117 percent.

[Table 5 about here]

To facilitate interpretation of this finding, we estimated predicted probabilities, setting control variables to their means and modes. These results are presented in Figure 1, which indicates that pledgers have slightly higher probabilities of out-of-wedlock pregnancies than nonpledgers at varying numbers of prior sex partners. For both groups, the prevalence of out-of-wedlock pregnancy is higher with only one partner when compared to the next three categories, a finding that we suspect is associated with relationship duration. At 11 prior sex partners or more, this gap between pledgers and nonpledgers becomes statistically significant, which we argue suggests that pledgers—with a predicted probability of nearly 0.52—are less likely to use contraceptives on a consistent basis. This result supports Hypothesis 1.

[Figure 1 about here]

HPV and Ever Being Diagnosed with an STD

Finally, we examine associations among pledging, sexual histories, and STD status. As shown in Table 6, we observe no difference between pledgers and nonpledgers in terms of HPV prevalence, which was based on biomarker data, whereas only 23 percent of pledgers, compared to 34 percent of nonpledgers, reported ever being diagnosed with an STD at Wave IV. The discrepancy in the reported instances of STDs appears to suggest that pledgers are less likely to be tested for STDs compared to nonpledgers. Moreover, Table 6 indicates that the association between pledging and STD status depends on the number of prior partners. Both the biomarker and self-reports of STDs indicate that the prevalence of STD infection rises with the number of

sexual partners, but it also quickly becomes apparent that pledgers have a higher prevalence of HPV and of ever being diagnosed with an STD as the number of prior partners increases.

[Table 6 about here]

As shown in Table 7, to investigate this relationship further, we estimated logistic regressions of STD experience among sexually active women. The results indicated that pledging was associated with lower odds of having HPV at Wave III and ever being diagnosed with an STD at Wave IV, whereas the number of prior sex partners was strongly associated with STD risk. In both models, we also observed an interaction between pledging and the number of prior sex partners, which indicates that the risk of HPV at Wave III and ever being diagnosed with an STD at Wave IV increases faster for pledgers compared to nonpledgers, a result that supports Hypothesis 2.

[Table 7 about here]

CONCLUSIONS

A spirited scholarly debate has developed within the past few decade centered on associations among abstinence beliefs, abstinence-only sex education, and virginity pledging, and numerous sexual and reproductive health outcomes. The vast majority of this research, however, has focused on the efficacy of prevention strategies on reducing negative sexual outcomes, while largely ignoring the lasting effects that these programs can have among individuals who fail to live up to their stated standards of belief and behavior. This research attempts to fill this important gap by examining the conditions under which breaches of abstinence beliefs are associated with negative sexual and reproductive health outcomes among young adults. We argue that the narrowness of various abstinence-only sexual education

programs fails to sufficiently prepare and inform young adults of the reproductive health habits that are necessary to maintain healthy lifestyles if and when the individual becomes sexually active. Specifically, in confirming our three hypotheses, we found that (i) among pledge breakers, the risk of perpetration of intimate partner violence is higher when compared to nonpledgers; (ii) pledge breakers have a higher risk of becoming pregnant outside of marriage compared to nonpledgers; and (iii) the risk for STD acquisition is higher among pledge breakers compared to nonpledgers.

The empirical evidence presented in this research has several theoretical and practical applications. From a theoretical standpoint, our models lend credence to the notion that the disjuncture between cultural meanings and social action is an important avenue for understanding behavior. Our evidence supports the idea that skills, habits, repertoires, and strategies for action can and do continue to pattern behavior even when the ideas and beliefs that originally motivated them are absent or no longer salient to an individual. For example, our models suggest that young adults are slow to adapt their scripting and habits with regards to contraceptive use and that they often fall back on previously acquired information, such as the mistrust of contraceptives obtained through abstinence-only programs, which is associated with increased instances of out-of-wedlock pregnancy and higher levels of STD infection.

Beyond the theoretical link between breaches of abstinence-only beliefs and negative sexual and reproductive health outcomes based on the cultural lag mechanism, this research also has several practical and policy-based applications. First and foremost, while abstinence-only sexual education and similar programs may arguably prove beneficial to adolescents and young adults who hold true to their strict requirements, our research suggests that these programs also need to adequately inform these populations of the skills and habits necessary to lead healthy

sexual and reproductive lifestyles in the event of breach. Importantly, this suggests that programs should include comprehensive sexual education, or at least some form of abstinence-plus education so that young adults will be adequately prepared to effectively manage their sexual wellbeing once they make the choice to become sexually active.

Further, this research also supports the notion that the increases in public and private funding for abstinence-only sexual education programs may lead to negative outcomes and actually exacerbate health risks among certain segments of the sexually active population. This suggests that if these funding programs are to continue, resources should be shifted from abstinence-only education toward more comprehensive programs that can more adequately prepare all segments of the young adult population.

This study, however, is not without its limitations. First, our central variable of interest includes all individuals who have ever publicly endorsed a virginity pledge, which means that we cannot assess the effect of virginity pledge persistence. Put simply, we do not have a measure that is capable of separating those respondents who pledged at Wave I and failed to do so at Wave III and vice versa, compared to those who renewed or reaffirmed their Wave I pledge at Wave III. To a certain extent, however, we argue that this limitation has little effect on our theory or results, as our central concern is whether a pledge has ever occurred and the relationship between being a pledger and our various outcomes.

Relatedly, it should be noted that our models cannot demonstrate that there is a causal relationship between pledging and our outcomes. Our argument, however, does not rest on pledging causing the negative outcomes we have outlined above. In our theory and in this research, engaging in a virginity pledge serves as a proxy for abstinence beliefs, and it is the presence of abstinence beliefs that is central to our argument. That is, within our theoretical

framework, whether the pledge was motivated by or motivated adherence to abstinence beliefs does not matter, rather, all that we are concerned with is the presence of these types of beliefs and their effect on behavior once sexual activity has been initiated.

Finally, we are unsure whether our findings are generalizable beyond the time period covered by the Add Health data due to the fact that the data was drawn during the initial frenzy surrounding the abstinence-only education and virginity pledge movement in the early 1990s. It is impossible to know, therefore, whether the respondents who engaged in pledging behavior in our data could or would be different from the types of individuals who may engage in similar behaviors today.

This research sought to examine the relationship between the breach of abstinence beliefs and several negative sexual and reproductive health outcomes. Through various modeling techniques with three samples of young adults, we demonstrated that abstinence beliefs can have long lasting negative effects on young adults once they engage in sexual activity, which suggests that serious improvements can be made to the current sexual education curriculum used in the United States. Furthermore, this research indicates that it is incumbent upon researchers in this area to examine the effects of breaches of abstinence beliefs when assessing the efficacy of the types of programs discussed in this study.

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Table 1. Unweighted Descriptive Statistics of Independent Variables

Variables	Male (N = 4,461)		Female (N = 5,294)		*Sig.*‡
Number of Partners					
One	20.6%		21.0%		
Two to Five	41.0%		46.4%		***
Six to Nine	19.5%		20.4%		
More than 10	19.0%		12.2%		***
Demographic and personal characteristics					
Age (in years)	16.32	(1.65)	16.15	(1.67)	***
Parents' education (in years)	13.23	(2.39)	13.07	(2.42)	**
Family structure					
Two biological parents	55.4%		52.0%		**
Step parent	10.2%		9.4%		
Single mother	21.9%		25.5%		***
Other	12.4%		13.2%		
Grade Point Average	2.66	(0.76)	2.87	(0.75)	***
Race /ethnicity					
White	56.8%		56.6%		
Black	18.3%		21.1%		**
Hispanic	16.3%		14.6%		**
Asian	6.7%		6.1%		
Other	2.0%		1.6%		
Educational Attainment (in years)	13.13	(1.92)	13.42	(2.00)	***
Public Assistance	0.7%		1.6%		***
Fight in Past 12 Mos.	43.4%		--		
Religiosity	-0.05	(0.84)	0.07	(0.82)	***
Religious Affiliation					
None	13.8%		12.5%		*
Catholic	27.1%		26.5%		
Mainline Protestant	23.2%		23.3%		
Other Protestant	28.6%		31.1%		**
Jewish	0.8%		0.8%		
Other Religion	6.5%		5.9%		
Age of Sexual Debut	16.57	(2.34)	16.52	(2.20)	
Depression Scale	1.47	(0.35)	1.58	(0.44)	***
Partnership Characteristics (Dyads)	Male (N = 6,530)				
Relationship Duration (in years)	1.91	(2.03)			
Relationship Duration (log)	0.86	(0.63)			
Age Difference (in years)	-0.14	(3.43)			
Interracial Partnership	22.0%				
Education Difference (in years)	-0.46	(2.47)			
Relationship Status					
Dating Only	62.1%				
Ever Cohabited	25.6%				
Ever Married	12.3%				
Years Since Wave I	4.05	(2.36)			

*p<.05. **p<.01. ***p<.001. (one-tailed test)

‡ Test for differences by gender for means and proportions

Table 2. Intimate Partner Violence Perpetration by Virginity Pledge according to Partner Concurrence (N=6,530) (Dyads)

		Virginity Pledge		
		No	Yes	Total
Exclusivity by Partner	Perpetration Percent	12%	11%	12%
	N	5,099	535	5,634
Nonexclusivity by Partner	Perpetration Percent	21%	45%	22%
	N	836	60	896

Table 3. GEE Population-Averaged
Logistic Regression of Male Intimate Partner Violence (N = 6,530)

	Model 1			Model 2			Model 3		
Variables	*Lg Odds*	(*SE*)		*Lg Odds*	(*SE*)		*Lg Odds*	(*SE*)	
Concurrency (Partner)	0.74	(0.13)	***	0.66	(0.13)	***	0.49	(0.10)	***
Took Virginity Pledge	0.14	(0.20)		-0.05	(0.21)		-0.11	(0.17)	
Concurrency x Virginity Pledge				1.07	(0.39)	**	1.27	(0.34)	***
Race (White)									
Black							0.60	(0.11)	***
Hispanic							0.23	(0.12)	*
Asian							0.40	(0.18)	*
Other Race							0.72	(0.25)	**
Age							-0.06	(0.03)	*
Family Structure (2 Bio)									
Step Parent							0.09	(0.14)	
Single Mother							0.04	(0.10)	
Other							0.18	(0.12)	
Parent Education							-0.07	(0.02)	***
Religiosity							0.07	(0.05)	
Fight in Past 12 Mos.							0.20	(0.08)	**
Relationship Duration (log)							0.46	(0.08)	***
Age Difference							-0.01	(0.01)	
Interracial Partnership							0.03	(0.10)	
Education Difference							-0.03	(0.02)	*
Relationship Status (Dating)									
Ever Cohabited							0.96	(0.09)	***
Ever Married							0.71	(0.13)	***
Years Since Wave I							-0.01	(0.02)	
Constant	-2.01	(0.06)	***	-1.99	(0.06)	***	-1.36	(0.53)	**
LR chi-square (*df*)	35.15 (2)		***	46.41 (3)		***	348.87 (21)		***

*p<.05. **p<.01. ***p<.001. (one-tailed test)

Table 4. Out of Wedlock Pregnancies among Young Women
by Virginity Pledge and Number of Sexual Partners (N = 5,302)

	Virginity Pledge		
Variables	No	Yes	Total
Number of Partners: 1			
Out of Wedlock Pregnancy	25.0%	25.8%	25.2%
N	795	319	1,114
Number of Partners: 2-5			
Out of Wedlock Pregnancy	36.0%	32.0%	35.3%
N	2,024	433	2,457
Number of Partners: 6-10			
Out of Wedlock Pregnancy	47.0%	39.8%	46.1%
N	942	142	1,084
Number of Partners: ≥11			
Out of Wedlock Pregnancy	49.2%	66.3%	51.2%
N	566	81	647
Overall			
Out of Wedlock Pregnancy	38.3%	34.0%	37.5%
N	4,327	975	5,302

Table 5. Logistic Regression of Out of Wedlock Pregnancies among Young Women at Wave III (N = 5,302)

Variables	*M1 OR*	(*SE*)		*M2 OR*	(*SE*)		*M3 OR*	(*SE*)		*M4 OR*	(*SE*)	
Virginity Pledge	0.83	(0.09)		0.96	(0.10)		1.05	(0.22)		1.29	(0.28)	
Number of Partners (One)												
Two to Four				1.46	(0.16)	***	1.52	(0.20)	**	1.10	(0.17)	
Five to Seven				2.20	(0.27)	***	2.35	(0.36)	***	1.43	(0.25)	*
Eight to Ten				2.81	(0.50)	***	2.91	(0.56)	***	1.56	(0.38)	*
Eleven or More				3.10	(0.39)	***	2.91	(0.45)	***	1.34	(0.27)	
Pledge x Number of Partners (2-4)							0.85	(0.23)		0.71	(0.21)	
Pledge x Number of Partners (5-7)							0.66	(0.23)		0.64	(0.26)	
Pledge x Number of Partners (8-10)							0.85	(0.32)		0.90	(0.36)	
Pledge x Number of Partners (>10)							1.94	(0.82)		2.17	(0.95)	*
Age (in years)										1.21	(0.04)	***
Parents' education (in years)										0.96	(0.02)	*
Family structure (Two Bio)												
Step parent										1.38	(0.20)	*
Single mother										1.36	(0.14)	**
Other										1.23	(0.15)	
Grade Point Average										0.80	(0.06)	**
Race /Ethnicity (White)												
Black										3.30	(0.45)	***
Hispanic										1.69	(0.25)	***
Asian										2.22	(0.48)	***
Other										1.47	(0.54)	
Educational Attainment (in years)										0.72	(0.03)	***
Public Assistance										1.72	(0.56)	*
Religiosity										0.94	(0.06)	
Religious Affiliation (None)												
Catholic										1.38	(0.26)	*
Mainline Protestant										1.56	(0.25)	**
Other Protestant										1.45	(0.27)	*
Jewish										1.66	(0.85)	
Other Religion										1.12	(0.22)	
Age of Sexual Debut										0.79	(0.02)	***
Depression Scale										1.25	(0.14)	*
Psuedo R^2	0.00			0.03			0.03			0.21		
BIC	7008.91			6865.40			6886.28			5794.44		

*p<.05. **p<.01. ***p<.001. (one-tailed test)

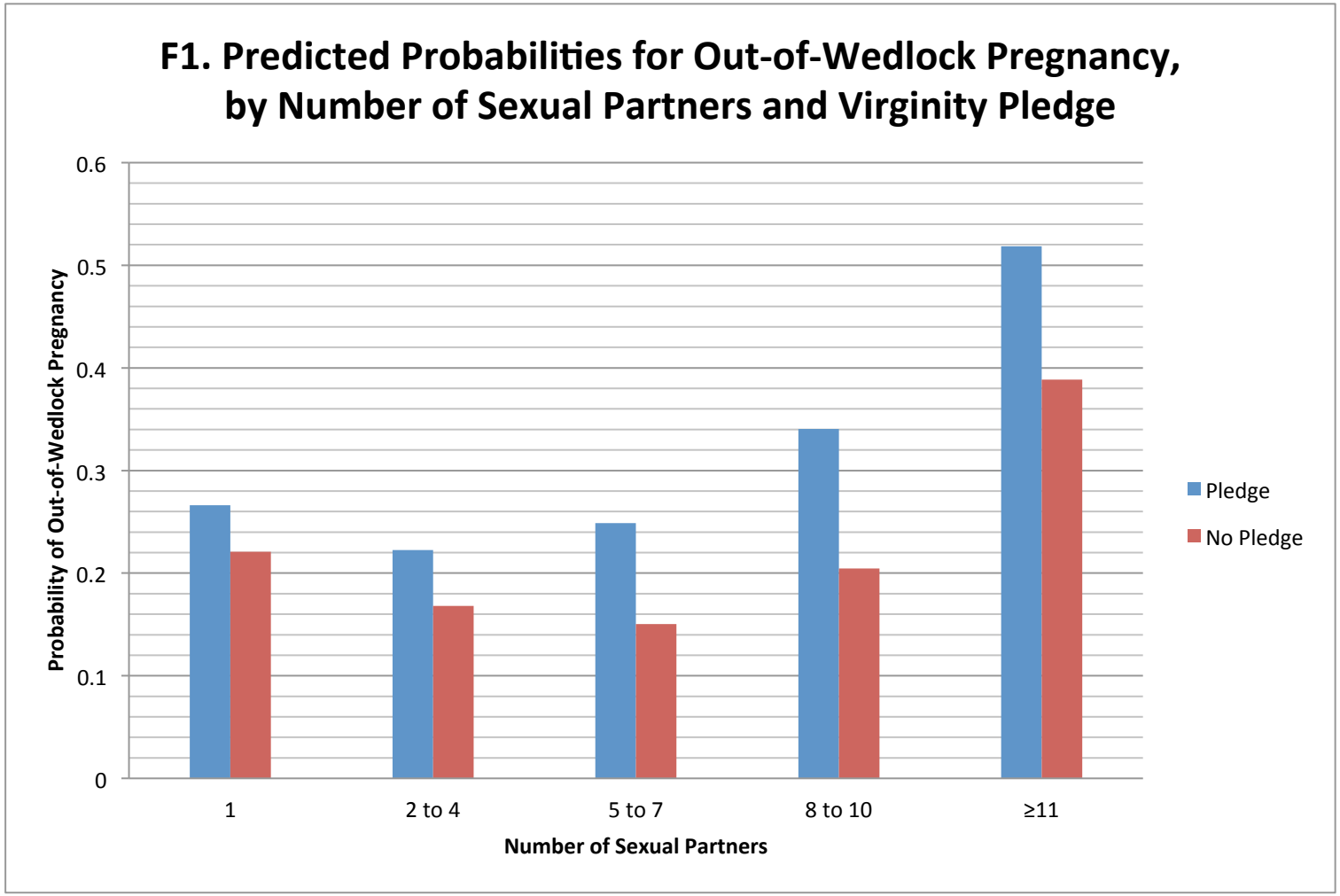
Table 6. STD Prevalence among Sexually Active Women by Virginity Pledge and Number of Sexual Partners at Wave III

Variables	Virginity Pledge (WIII) No	Yes
HPV prevalence at Wave III (biomarker)		
All sexually active women (N=3,266)	0.27	0.27
1 sex partner (n=681)	0.15	0.11
2-4 sex partners (n=1,177)	0.27	0.26
5-7 sex partners (n=657)	0.28	0.37
8-10 sex partners (n=360)	0.36	0.61
11+ partners (n=391)	0.32	0.43
STD ever at Wave IV		
All sexually active women (N=6,389)	0.34	0.23
0-1 sex partner (n=1,963)	0.17	0.09
2-4 sex partners (n=2,028)	0.31	0.23
5-7 sex partners (n=1,114)	0.42	0.47
8-10 sex partners (n=599)	0.50	0.63
11+ partners (n=685)	0.53	0.68

Table 7. Logistic Regression of STD Experience among Sexually Active Women

	HPV at Wave III			Any STD at Wave IV		
Variables	*OR*	(*SE*)		*OR*	(*SE*)	
Virginity Pledge	0.37	(0.22)	*	0.53	(0.16)	*
Number of partners (logged)	1.70	(0.16)	***	2.01	(0.13)	***
Pledge x number of partners (logged)	1.93	(0.62)	*	1.59	(0.33)	*
Age (in years)	0.88	(0.03)	***	0.88	(0.03)	***
Parents' education (in years)	1.04	(0.03)		1.03	(0.02)	
Family structure (Two Bio)						
Step parent	0.97	(0.19)		0.95	(0.16)	
Single mother	0.89	(0.13)		0.98	(0.10)	
Other	0.60	(0.11)	**	1.19	(0.16)	
Grade Point Average	0.89	(0.08)		1.03	(0.06)	
Race /Ethnicity (White)						
Black	1.39	(0.21)	*	3.03	(0.29)	***
Hispanic	1.46	(0.28)	*	1.34	(0.18)	*
Asian	0.64	(0.24)		0.76	(0.19)	
Other	0.95	(0.44)		1.21	(0.35)	
Educational Attainment (in years)	1.04	(0.04)		1.02	(0.02)	
Religiosity	1.03	(0.07)		0.93	(0.04)	
Religious Affiliation (None)						
Catholic	0.85	(0.19)		1.23	(0.20)	
Mainline Protestant	0.77	(0.17)		1.01	(0.15)	
Other Protestant	1.17	(0.29)		1.03	(0.16)	
Jewish	0.99	(0.55)		1.59	(0.52)	
Other Religion	0.75	(0.22)		1.14	(0.21)	
Age of Sexual Debut	1.09	(0.04)	*	0.92	(0.03)	**
Depression Scale	1.26	(0.14)	*	1.40	(0.13)	***
n	3,080			6,033		

*p<.05. **p<.01. ***p<.001. (one-tailed test)


F1. Predicted Probabilities for Out-of-Wedlock Pregnancy, by Number of Sexual Partners and Virginity Pledge
Probability of Out-of-Wedlock Pregnancy
0.6
0.5
0.4
0.3
0.2
0.1
0
1
2 to 4
5 to 7
8 to 10
≥11
Number of Sexual Partners
Pledge
No Pledge