

The Opposite of Sex? Adolescents' Thoughts About Abstinence and Sex, and Their Sexual Behavior

CONTEXT: Little research has explored how teenagers think about abstinence and how it functions in their lives. These questions are particularly salient in light of widespread funding of abstinence-only programs in the United States.

METHODS: Data on attitudes and intentions related to abstinence and sex were collected from 365 adolescents aged 12–15 who participated in an HIV risk reduction program in Seattle in 2001–2003. Logistic regression analyses assessed associations between these cognitions, as measured six months after the program, and teenagers' likelihood of having vaginal or anal sex in the subsequent six months.

RESULTS: Adolescents who had positive attitudes and intentions about abstinence had a reduced likelihood of subsequently engaging in sex (odds ratio, 0.6 for each), whereas those with positive attitudes and intentions about having sex had an elevated likelihood of engaging in sex (2.2 and 3.5, respectively). A regression model including only sex cognitions accounted for substantially more variation in sexual activity than did one including only abstinence cognitions (15–26% vs. 6–8%). Significant interaction effects were also seen: Among teenagers with low levels of sex intention, greater abstinence intention had little relationship to the predicted probability of having sex, but among teenagers with high levels of sex intention, greater abstinence intention was associated with increases in the predicted probability of having sex.

CONCLUSIONS: Youth do not consider abstinence and sexual activity opposing constructs, and solely instilling positive abstinence attitudes and intentions in youth may not have robust effects in preventing sexual activity.

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Sexual activity can have both positive and negative outcomes for people of any age. Young people are at heightened risk for some negative sexual outcomes, such as unplanned pregnancy and STDs, including HIV. Although the adolescent pregnancy rate has declined significantly in the United States since 1990, it remains much higher than that in other developed countries,¹ and nearly 750,000 teenagers become pregnant each year.² STD rates are also high in the United States; approximately 19 million new infections occur each year, and nearly half of these are among adolescents and young adults.³ In 2000, youth aged 15–24 made up only 25% of the sexually active U.S. population, but they accounted for 48% of new STDs.³ Better understanding of the processes that lead to potentially risky sexual behavior in adolescents could inform the development and evaluation of evidence-based programs to prevent negative sexual outcomes.

SEX EDUCATION AND ABSTINENCE

Efforts to prevent negative sexual outcomes among teenagers have taken two principal approaches: comprehensive sex education and abstinence-only programs.⁴ Comprehensive sex education programs provide youth with information on pregnancy and STDs; sexual relationships, orientation and values; decision making and

negotiation; and contraception, condoms and safer sex. Their intent is to equip teenagers to have positive sexual outcomes and prevent negative ones. These programs include information on abstinence as a valid sexual choice and often teach techniques for saying no to unwanted sex. In contrast, abstinence-only programs instruct adolescents to abstain from sex until marriage or to become “secondary virgins” by ceasing sexual activity until marriage. Typically, such programs limit the discussion of contraception and condoms to their failure rates,⁵ and teach the “gains to be realized by abstaining from sexual activity” and that a “mutually faithful monogamous relationship in the context of marriage is the expected standard of human sexual activity.”^{6(p. 470)} While no current federal initiative supports comprehensive sex education,⁷ federal support for abstinence-only programs is both abundant and increasing, growing from \$9 million to \$176 million between 1997 and 2007.⁸

In light of the widespread provision and funding of abstinence-only programs in the United States,^{8,9} it would be helpful to better understand how teenagers think about abstinence and how it functions in their lives. However, little research has explored these questions. The most rigorous studies of abstinence-only programs have evaluated intentions to be abstinent, rather than avoidance of sexual behavior.⁵ This is not an unusual

approach, given that theoretical models propose that cognitive mechanisms like intentions influence behavior; however, no studies have demonstrated that abstinence intentions predict sexually abstinent behavior. In contrast, associations have been found between sex cognitions, including intentions, and the likelihood of having sex. To investigate the relationship between abstinence intentions and actual behavior, it is necessary to differentiate between abstinence cognitions and sex cognitions.

A central question is whether teenagers regard “having sex” and “being abstinent” as opposites, as is often assumed, or whether their understanding of these constructs is more complex. One qualitative study found that adolescents considered abstinence to be not so much a health choice, or even a moral choice, as a stage of life that was naturally followed by a sexually active life stage, once the teenager was “ready.”¹⁰ “Readiness” for sex also appeared to play a role in a survey that investigated young women’s reasons for having or not having sexual intercourse; beliefs and values were cited as reasons for not only abstaining from sex, but also engaging in sexual activity.¹¹ Furthermore, in a prospective cohort study of 12–15-year-old females, changes in teenagers’ sexual behavior (including intercourse, manual sex and oral sex) over a one-year period did not differ by their abstinence attitudes.¹² These findings demonstrate that there is much to learn regarding youths’ cognitions about sex and abstinence, and raise questions about whether and how these cognitions interact to influence sexual behavior.

ATTITUDES AND INTENTIONS

Although sexual intercourse among adolescents has been characterized as unplanned and impulsive,¹³ some research suggests an underlying cognitive decision-making process. Attitudes and intentions, two cognitive constructs commonly found to be antecedents of sexual behavior, were examined in this study. The selection of these constructs and the techniques used to measure them were guided by the theory of reasoned action¹⁴ and the theory of planned behavior.^{15,16} According to these models, engaging in a behavior (e.g., being abstinent or having sex) can be predicted by an individual’s intention to perform the behavior. Intention, in turn, is a function of two factors: the individual’s attitude toward the behavior (how desirable or undesirable the behavior is) and the individual’s perception of social norms regarding the behavior (what others think is desirable or undesirable).

Evidence suggests that attitudes and norms predict adolescents’ intentions to have sex, and that intentions predict behavior.^{17,18} Although these studies focused on engaging in sex, there is reason to believe that these cognitions may also be predictive of abstaining from sex: Attitudes and intentions are fairly robust predictors of different aspects of adolescent sexual behavior, such as use of condoms^{19–23} and other contraceptives,²⁴ as well as frequency of sex and number of partners.^{19,25} Further-

more, two meta-analyses have found that attitudes and intentions predict health behavior, including condom use and other safer-sex strategies.^{26,27}

None of the studies summarized above examined cognitions specifically regarding abstinence, and some research has suggested that abstinence may not be as simple a concept—particularly to youth—as often is assumed.^{10,12,28} To elucidate the role of cognitions about being abstinent and about having sex, the present study assessed the role of attitudes and intentions in influencing each behavior. We determined the strength of the relationship between abstinence cognitions and sex cognitions, as well as how well these cognitions predicted (both independently and jointly) whether teenagers engage in sex.

Our first hypothesis was that the association between the two types of cognitions would be moderate at best. Our second hypothesis was that the likelihood of having sex would be reduced among youth who had positive attitudes about abstinence and elevated among those with positive attitudes about sex. Third, we hypothesized that the likelihood of having sex would be reduced among youth with positive abstinence intentions and elevated among those with positive sex intentions. Finally, we hypothesized that if teenagers perceived the ideas of being abstinent and having sex as opposites, then abstinence cognitions would not improve the ability of sex cognitions to predict whether individuals would engage in sex. However, we expected that if youth viewed abstinence and sexual activity in a more complex way, then the combination of abstinence and sex cognitions might explain more of the variation in our study’s main outcome—having sex—than would either set of cognitions alone.

METHODS

Study Design

The data are from an eight-week, community-based intervention replication study, Teens Take Charge, based on the Focus on Kids program, which had been effective in reducing HIV risk behavior among young teenagers in Baltimore.²⁹ Our study, conducted in Seattle in waves from August 2001 through February 2003, compared the intervention with a career exploration program in a randomized controlled experiment, which revealed no significant effects on cognitions or behaviors.³⁰

Staff recruited participants from 20 community centers, youth programs and after-school programs. Recruiters explained the study to groups of youth at each site, and interested individuals received an intake form asking for parent or guardian contact information and whether consent materials should be in English or another language (they were translated into six languages). All parents and guardians for whom information was collected were then sent a study description and a consent form, and follow-up phone calls and in-home visits were conducted to answer any questions; where

needed, bilingual staff verified consent with non-English-speaking parents by phone or in person. Further contact with youth was made only after parents had consented to their children's participation. All study procedures and protocols were reviewed and approved by the University of Washington's Human Subjects Review Board.

Overall, 2,017 youth received the initial information about the study; of these, 84% expressed interest and completed an intake form. Seven percent of these youth were not eligible because they did not meet the requirement that participants be aged 12–15 at the beginning of the study. Of the remaining youth, 1,052 were excluded because their parents or guardians declined to give consent (138), were contacted but had not accepted or declined when the study began (202), could not be contacted by phone before the study began (613) or did not return consent forms even though they had given verbal consent (99).

We obtained written parental consent for 534 youth; 454 were able to attend sessions and thus participated in the study. Participants were divided into 54 single-gender groups, each with an average of eight youth; equal proportions of male and female groups were randomly assigned to attend intervention or control sessions. Interviewers reviewed study details with participants, answered their questions, and obtained their assent and contact information. Participants completed surveys immediately prior to the first of eight weekly sessions (baseline), at the last session, and six and 12 months after the end of the program, using computer-assisted survey techniques to ensure privacy and comprehension. Ninety-two percent of participants completed the six-month survey, 93% the 12-month survey and 89% both surveys. Some 365 youth completed all survey assessments and were missing no data on the attitude, intention and sexual behavior variables used in our analyses; they did not differ significantly from the youth with missing data (who were excluded from our study) regarding their demographic or cognitive characteristics, or whether they were sexually active.

Measures

We assessed participants' attitudes toward and intentions about being abstinent and having sex at the six-month follow-up. The measures had been developed and used in previous studies, and had been found to have acceptable reliability and validity.^{18,31} Where appropriate, scoring was reversed so that a positive attitude or intention corresponded with a higher value. Because single items are typically considered less reliable than multiple-item scales, we created attitude and intention scores for being abstinent and having sex by calculating the means of the items for each construct.

•**Attitudes.** We measured abstinence attitudes with three items scored on five-point scales. The stem of each item was "Do you think avoiding having sex (being abstinent) in the next six months would be. . ." The first scale ranged

from "very bad" to "very good," the second from "very unpleasant" to "very pleasant" and the third from "very awful" to "very nice." Sex attitudes were measured by "Do you think if you had sexual intercourse in the next six months it would be. . ." and were answered using the same three scales. The alpha was 0.93 for the abstinence attitudes items and 0.96 for the sex attitudes items.

•**Intentions.** We measured abstinence intentions with three items: "In the next six months, do you intend/expect/plan to avoid (abstain from) having sexual intercourse?" These were answered on a four-point scale (YES!, yes, no, NO!). Sex intentions were measured similarly with three items: "In the next six months, do you intend/expect/plan to have sexual intercourse?" The alpha for the abstinence intentions items was 0.93; for the sex intentions items, it was 0.95.

•**Sexual activity.** We assessed participants' sexual activity at baseline, six months and 12 months by asking "In the past six months, when you 'made out' with someone, how often did you have vaginal sexual intercourse (penis in the vagina)?" Response categories were "every time," "more than half of the time," "about half of the time," "less than half of the time" and "never." A similarly worded item asked about anal sex. Responses at the 12-month follow-up were used to create a dichotomous variable of whether participants reported any vaginal or anal sex (versus no sex) in the past six months. (We used vaginal or anal sex, but not oral sex, as an indicator of sexual activity because of the STD risks associated with each behavior.) Only three participants reported anal sex without also reporting vaginal sex.

Analysis

We calculated means and standard deviations of attitude and intention scores regarding abstinence and having sex for males and females, then conducted t tests to determine whether means were significantly different between genders. To assess the practical significance of any differences, we calculated effect size using Cohen's *d*.

We used logistic regression analyses to assess associations between the cognitive variables measured at six months and whether participants had sex between that time and the 12-month follow-up. All predictor variables were mean-centered before we conducted the analyses. Preliminary models were run separately by gender for each hypothesis, and odds ratios were compared. Since these were of the same magnitude and direction for males and females, the genders were combined for further analysis. In the logistic regressions, Nagelkerke's R^2 was calculated to approximate the proportion of variance in outcome accounted for by the overall model.

We tested our first hypothesis—that the association between abstinence cognitions and sex cognitions would be moderate at best—by examining the correlations between abstinence attitudes and sex attitudes, and between abstinence intentions and sex intentions. Our hypothesis regarding teenagers' likelihood of having sex

TABLE 1. Means (and standard deviations) of attitude and intention scores regarding abstinence and having sex, by gender, among youth aged 12–15, Seattle, 2001–2003

Measure	Males (N=135)	Females (N=230)	t	Cohen's d
Attitudes				
Abstinence	3.59 (0.96)	4.00 (1.01)	-3.82***	-0.41
Sex	3.49 (1.15)	2.78 (1.18)	5.57***	0.60
Intentions				
Abstinence	2.73 (1.01)	3.26 (0.91)	-5.17***	-0.56
Sex	2.06 (0.92)	1.54 (0.75)	5.79***	0.63

***p<.001. Notes: Range for attitude measures is 1–5, and range for intention measures is 1–4. Higher scores reflect more positive attitudes and intentions. Typical interpretation of Cohen's d is 0.20=small effect size, 0.50=medium and 0.80=large.

was tested in two regressions, one using abstinence attitudes as the predictor and the other using sex attitudes. A third regression examined whether the interaction between abstinence attitudes and sex attitudes was a stronger predictor of sexual activity than either alone. Similarly, our hypothesis on the influence of teenagers' intentions on having sex was tested in separate regressions for abstinence and sex intention, followed by a regression of the interaction of the two. Finally, we used logistic regression coefficients to calculate adolescents' predicted probabilities of having sex based on each of the cognitive variables in turn and on the interaction of their abstinence and sex intentions; though less widely used than odds ratios, these probabilities are a more intuitive way of interpreting regression results.

RESULTS

The final sample of 135 males and 230 females had a mean age of 12.8 (standard deviation, 0.9). Forty-seven percent were black, 21% were Asian or Pacific Islander,

10% were white, 8% were African immigrants, 7% were of mixed race, 6% were Latino and 1% were of other races or ethnicities. Very few participants—11% of males and 4% of females—were sexually experienced at baseline. Some 12% of males and 8% of females had had vaginal or anal intercourse at least once by the six-month follow-up, as had 22% and 12%, respectively, by the end of the study.

Mean attitude and intention scores at six months differed significantly between males and females, and the effect sizes (indicated by Cohen's d) show that these differences were also practically significant to a moderate degree—that is, they were detectable in the real world (Table 1). Participants of both genders reported positive attitudes about abstinence, although males somewhat less so than females (means, 3.6 vs. 4.0; on the five-point attitude scales, on which a score of 3 was neutral); males had positive attitudes about having sex, whereas females had more neutral attitudes (3.5 vs. 2.8). Males reported relatively neutral intentions about abstaining and about having sex (2.7 and 2.1, respectively, on the four-point intention scales, on which a score of 2.5 was neutral), while females reported positive intentions about abstaining and negative intentions about having sex (3.3 and 1.5, respectively).

Hypothesis Testing

•*Correlations between sex cognitions and abstinence cognitions.* Cognitive variables were significantly correlated with one another in the expected directions, though not highly enough to suggest that abstinence cognitions and sex cognitions can be considered the same constructs. Abstinence attitudes had a moderate negative correlation with sex attitudes ($r=-0.31$, $p<.001$) and explained about 10% of the variation in teenagers' attitudes about having sex. Abstinence intentions had a stronger, though still moderate negative correlation with sex intentions ($r=-0.50$, $p<.001$). They explained 25% of the variance in adolescents' sex intentions.

•*Attitudes as predictors of having sex.* Youth who had positive attitudes about abstinence at the six-month survey had a reduced likelihood of having sex within the next six months (odds ratio, 0.6–Table 2), whereas youth with positive attitudes about having sex at six months had an elevated likelihood of engaging in sex before the next follow-up (2.2). We also computed the predicted probability of having sex on the basis of teenagers' abstinence and sex attitudes: As abstinence attitude scores increased from 1 to 4 (no participants scored a 5 on either attitude scale), the probability of having sex, as predicted by the regression equation coefficients, decreased from 41% to 14%. As sex attitude scores rose from 1 to 4, the probability of having sex increased from 3% to 23%. The sex attitude model accounted for noticeably more variance in the likelihood of having sex than did the abstinence attitude model (15% vs. 6%).

The interaction of abstinence attitudes and sex attitudes in predicting whether teenagers had sex between

TABLE 2. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the association between adolescents' attitudes and intentions and their likelihood of having vaginal or anal intercourse in the next six months

Measure	Odds ratio	Nagelkerke's R ²
ATTITUDES		
Main effects		
Abstinence	0.61 (0.46–0.81)***	0.06
Sex	2.15 (1.61–2.88)***	0.15
Interaction		
Abstinence × sex	1.05 (0.82–1.34)	0.17
Abstinence	0.69 (0.49–0.96)*	na
Sex	2.05 (1.50–2.79)***	na
INTENTIONS		
Main effects		
Abstinence	0.55 (0.42–0.73)***	0.08
Sex	3.53 (2.48–5.03)***	0.26
Interaction		
Abstinence × sex	1.58 (1.07–2.32)*	0.28
Abstinence	0.79 (0.54–1.15)	na
Sex	4.40 (2.68–7.21)***	na

*p<.05. ***p<.001. Note: na=not applicable.

follow-up surveys was not statistically significant, which suggests that the association between abstinence attitudes and sexual behavior remains the same regardless of youths' attitudes about having sex.

•**Intentions as predictors of having sex.** Youth who had positive intentions to abstain from sex at six months had reduced odds of having sex between then and the 12-month survey (odds ratio, 0.6), and youth with positive intentions to have sex had increased odds of engaging in sex (3.5). As abstinence intention scores increased from 1 to 4, the probability of having sex decreased from 36% to 9%. As sex intention scores rose from 1 to 4, the probability of having sex increased from 5% to 69%. The sex intention model accounted for substantially more variance in the likelihood of having sex than did the abstinence intention model (26% vs. 8%).

The interaction between the two types of intentions was statistically significant and contributed to the prediction of whether teenagers would have sex. This suggests that the association of abstinence intentions and sexual behavior differs by youths' sex intentions; that is, sex intention modifies the effect of abstinence intention on sexual behavior. The model that included both intention variables and the interaction term accounted for somewhat more variance than the simple sex intentions model (28%), but abstinence intention was not statistically significant in this model.

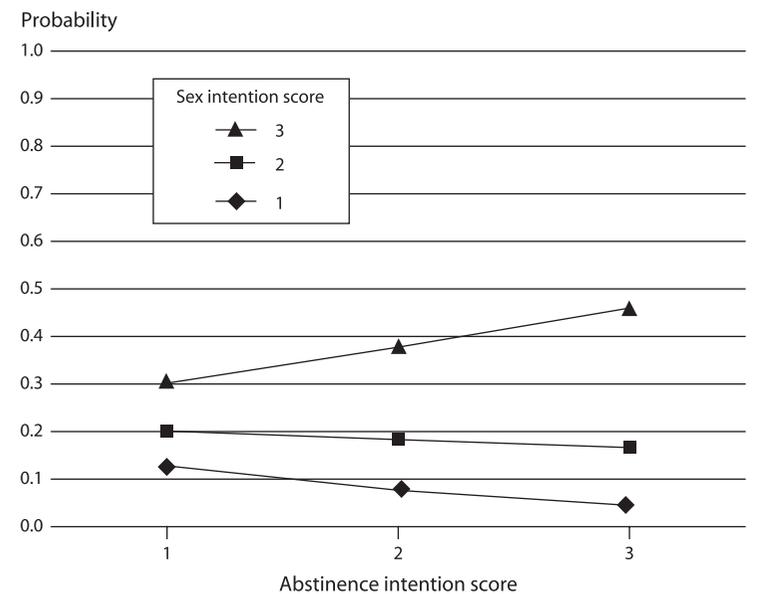
Analysis of the statistically significant interaction between types of intentions shows that at low levels of sex intention, abstinence intention had little effect on the predicted probability of having sex, but at a high level of sex intention, higher abstinence intention was associated with an increased probability of having sex (Figure 1). (Intention scales ranged from 1 to 4, but because no teenagers had scores of 4 on both scales, we limited this analysis to scores of 1–3.)

DISCUSSION

This study sheds light on how adolescents understand abstinence and how their abstinence attitudes and intentions influence their sexual activity. Though participants as a group expressed positive attitudes toward abstinence and neutral (for males) to positive (for females) intentions to be abstinent, one in five males and one in eight females had had sex at least once by the end of the study.

These findings suggest that youth do not consider abstinence and sexual activity opposing constructs. If they did, we would have seen a stronger negative correlation between abstinence cognitions and sex cognitions. Our findings align with previous qualitative and quantitative findings on adolescents' conceptualizations of abstinence,^{10–12,28} demonstrating that teenagers consider abstinence and sex to be linked in complex ways, and view abstinence as not simply the “opposite of sex.” Youth may view abstinence as a developmentally appropriate

FIGURE 1. Adolescents' probability of having vaginal or anal intercourse, as predicted by the interaction of abstinence and sex intentions



Note: Scales ranged from 1 to 4, but analysis was limited to scores of 1–3 because no teenagers had scores of 4 on both scales.

stage, which precedes the equally appropriate stage of becoming sexually active when they are “ready,” as Ott and her colleagues report.¹⁰ Teenagers, especially females, may see endorsing abstinence as socially desirable, while their feelings about sexual activity may be far more complex, including elements of both desire and coercion.³²

Our results also indicate that abstinence cognitions may be poorer predictors of sexual behavior than sex cognitions. Positive abstinence attitudes and intentions significantly predicted a lower likelihood of engaging in sex, but positive sex attitudes and intentions were more powerful predictors; as expected, they predicted a higher likelihood of having sex. Regression models that included sex cognitions accounted for substantially more of the variation in sexual activity than did those including only abstinence cognitions. It is critical to precisely define cognitive variables when using them to predict behavior. Furthermore, our research highlights the value of considering sexuality in a way that acknowledges its potential to be a positive element of adolescents' lives, since conceptualizing adolescent sexual behavior exclusively as something to be prevented may preclude examination of youths' complex thinking regarding abstinence and sexual activity.

Abstinence cognitions and sex cognitions also appear to interact in ways that have not been elucidated. In teenagers with low levels of sex intention, greater abstinence intention had little effect on the predicted probability of having sex, but in teenagers with high levels of sex intention, greater abstinence intention was associated with an increased probability of having sex. This increase could be due to youths' perception of abstinence as part of

the developmental trajectory that eventually leads to sexual activity.¹⁰ In this model, adolescents who have stepped onto the “sexual escalator” will start at abstinence and move toward sexual activity. These teenagers will have strong opinions about abstinence and about having sex, and may have opportunities to choose between the two that their peers who have not stepped onto the “escalator” may lack. Teenagers who have not yet given sex or abstaining from sex much thought may not be choosing abstinence so much as finding the “sex versus abstinence” choice not relevant.

Furthermore, teenagers with high abstinence intentions may, paradoxically, be less well equipped to decide and negotiate their preferences regarding sexual activity. For example, participation in “virginity pledging,” often an element of abstinence-only education programs, has been associated with a reduced likelihood of contraceptive or condom use at first intercourse.³³ Strong abstinence intentions may be linked with a view of sexual behavior that minimizes the role of personal choice and agency in making sexual decisions, particularly for females.^{32,34} Teenagers' identification of themselves as people committed to abstinence could keep them from considering situations in which they might someday choose to engage in sexual behavior and from learning how they might then protect themselves against unwanted pregnancy and STDs.

Limitations

One limitation of this study is the dependence on youths' self-reporting of sexual behavior, a limitation common to all survey research. The models employed abstinence and sex cognitions as measured at one time to predict sexual activity six months later; however, measuring cognitions at a time closer to behavior, or taking more frequent measures of both cognitions and behavior, may produce somewhat different results. Whether these findings would differ according to youths' socioeconomic class, race or ethnic identity are good questions for future research; unfortunately, this sample was not large enough to examine such questions. The sample size, and the fact that the majority of the teenagers were sexually inexperienced at baseline, also precluded the examination of sexual experience as a potential moderator of the influence of abstinence cognitions on sexual behavior; working with an older sample may have allowed us to explore this question.

Implications

Evaluators and federal funders of abstinence-only programs frequently define success in terms of the impact that these programs have on adolescents' attitudes and intentions about abstinence.^{5,35} Our findings cast doubt on whether solely instilling positive abstinence attitudes and intentions in youth can be expected to have robust effects in preventing sexual activity. At best, abstinence cognitions seem to be less strongly linked to

teenage sexual behavior than are sex cognitions. At worst, among youth who strongly intend to have sex (a not uncommon status among teenagers, particularly as they grow older), strong abstinence intentions may be associated with an elevated likelihood that sex will occur. If the goal is preventing adolescent sex, programs aimed simply at strengthening abstinence intentions might not have the intended effects, especially if they do not affect sex intentions at the same time. However, programs that attempt to address this difficulty by increasing teenagers' negative cognitions about having sex along with their positive cognitions about being abstinent might still have the same “boomerang effect” in the long term if teenagers' circumstances change. A new relationship or a change in normative peer influences, both common experiences for youth, could cause a change in sex cognitions and lead to the same paradoxical effect.

Some researchers have questioned whether preventing adolescent sex itself, as opposed to preventing negative sexual outcomes, is in the best interests of youth, their families or their communities.^{36,37} From an empirical perspective, comprehensive sex education has demonstrated its effectiveness in reducing negative sexual outcomes such as teenage pregnancy and STDs, whereas abstinence-only programs have not.^{5,38,39} The Society for Adolescent Medicine⁴⁰ has stated that public funding for abstinence-only programs should cease and that abstinence should be taught as one of many healthy choices in the context of comprehensive sex education programs. Our findings raise serious concerns about the abstinence-only approach as a risk reduction method for adolescent sexual behavior.

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