

“Abstinence” or “Comprehensive” Sex Education?

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The debate about “abstinence” vs. “comprehensive” sex education has been occurring for at least three decades.^b The common ground that drives these competing approaches is concern about the negative consequences of adolescent sexual activity to the health and well-being of individuals and society. This debate has been re-energized recently by the release of findings from a national study by *Mathematica Policy Research, Inc.*, in which four different abstinence education programs were selected as subjects for a long-term evaluation. This study reported that teen participants in these abstinence programs did *not* abstain from sexual activity more than non-participants, when measured 2½ to 5½ years after the program ended.¹

These results have caused some to conclude that the abstinence approach to preventing teen sexual risk behavior does not work. As one advocate of the “comprehensive” approach stated, “This report should serve as the final verdict on the failure of the abstinence-only industry in this country.”² Implicit in such statements is the corollary conclusion that the comprehensive sex education approach *does* work. Neither of these conclusions is supported by the full body of research evidence about “abstinence” and “comprehensive” sex education.

While new evidence can add to the debate, it should never be accepted without scrutiny, and should be viewed alongside the broader base of evidence upon which important policy questions must rely. We have reviewed that body of evidence pertaining to “abstinence” and “comprehensive” approaches to education regarding teen sexual activity. Our institute has also conducted more than 100 evaluations of abstinence education interventions in 30 states over the past 15 years. We draw on this broad base of evidence to share the following observations.

- Many serious problems are associated with adolescent sexual activity.
- Condom interventions have serious limitations.
- When held to the same criteria employed by the *Mathematica* evaluation, comprehensive sex education programs do not appear to work.
- The *Mathematica* study, and the four programs it evaluated, cannot be generalized to represent the efficacy of abstinence programs in general.
- Several well-designed evaluations of abstinence programs have found significant, long-term reductions in adolescent sexual activity.
- Abstinence education offers benefits to adolescents and society that are not found in the comprehensive sex education approach.
- Abstinence interventions are most effective if they incorporate what has been learned about how to reduce adolescent sexual risk behavior.

We have found that well-designed and well-implemented abstinence education programs can reduce teen sexual activity by as much as one half for periods of one to two years. For a more detailed discussion of each of our points above, see the pages that follow.

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^b “Comprehensive” interventions place primary emphasis on teaching prevention methods for sexually active teens, centered on the use of condoms, although some also present abstinence as the preferred option. “Abstinence” interventions place primary emphasis on teaching the postponement of sexual initiation or the discontinuation of sexual activity, and often include information about the limits of condoms in preventing STDs. For the purposes of this paper, we will also refer to comprehensive sex education as condom-based interventions.

I. Consequences of Teen Sex—*In 2005, 63.1% of American adolescents had experienced sexual intercourse by the end of high school.³ Many serious health and social problems in American society are related to teen sexual activity. These include:*

- A. **Teen Pregnancy:** One in 13 high-school-age girls becomes pregnant each year in America.⁴ Adverse consequences associated with teen pregnancies include abortion, unwed teen parenthood, father absence, poverty, welfare dependence, and the growth of drug abuse, gang culture, and crime.⁵⁻⁹
- B. **STDs:** STDs have emerged as a significant threat to adolescent health. The consequences include chronic pelvic pain, genital lesions, lifetime infection, infertility, ectopic (tubal) pregnancy, damage to unborn children, cancer, and in some cases death.¹⁰⁻¹³ Adolescent STD rates are higher than rates for all other age groups. One quarter of sexually active teens have an STD,¹ and adolescent rates for most STDs are on the rise.^{11,14,15} The growing STD problem has been called a hidden epidemic.^{11,16} The direct medical cost of 9 million new cases of STDs that occurred among U.S. adolescents and young adults (15–24-year olds) in the year 2000 was estimated at \$6.5 billion (in year 2000 dollars).¹⁷
- C. **Poorer Emotional Health:** There is a strong association between sexual activity and poor emotional health for adolescents.
 - 1. Sexually active teens are more than twice as likely as virgin teens to be depressed or attempt suicide. Adolescents report a drop in self-esteem after initiating sexual intercourse, and the majority express regret for becoming sexually active.¹⁸⁻²¹
 - 2. Sexually experienced teens, especially girls, are much more likely to experience dating violence than their virgin peers, and sexual exploitation (such as statutory rape) and unwanted or forced intercourse/rape are not uncommon among sexually experienced teen girls. In 2005, one out of eight 12th grade girls in the U.S. reported being physically forced to have intercourse against her will.^{3,22,23}

II. Condom Limitations—*Condom use is advocated by many as the best protection for the sexually active from both pregnancy and STD transmission. Yet many consequences of teen sexual activity are not prevented by condom use.*

- A. Even with consistent and correct use (which is rare), condoms may diminish but do not effectively prevent STDs that are spread through skin-to-skin or skin-to-sore contact. These STDs are on the rise in the adolescent population.²⁴⁻²⁷
- B. After 20-plus years of comprehensive sex education efforts in the U.S., adolescent rates of consistent condom use are not high enough to eliminate the STDs for which condoms are most preventive, such as HIV, let alone STDs for which condoms are least preventive. Adolescents contract one fourth of all new HIV infections.¹⁵ Among sexually active U.S. teens, only 47.8% of males and 27.5% of females report using condoms consistently over a one-year period.²⁸ Efforts to improve those rates have not proven successful.
- C. Consistent condom use cannot prevent the negative emotional impact or the sexual exploitation and sexual violence that are associated with teen sexual activity, as described above.

III. Failure of Comprehensive Programs—*When studies are held to the same criteria as the Mathematica evaluation (random assignment, a follow-up period of 2½ to 5½ years, a high level success criteria), there is ample evidence that condom-based sex education interventions do not work.* In the past 20 years, studies evaluating abstinence education programs have been limited in number and in rigor, while during the same time period research on comprehensive sex education has abounded.^{29–32} One recent and thorough summary of this research³³ reviewed 50 well-designed evaluation studies of comprehensive sex education programs in the United States, going back to 1990, and included these findings:

- A. None of the programs increased the prevalence of *consistent condom use* (CCU)^c among adolescents for a period greater than one year. CCU is the only condom measure that approaches the stringent standard of the abstinence measure. Only one program produced a significant increase in the prevalence of CCU that was sustained for a period of one year.³⁵
- B. Thirteen control trials of comprehensive sex education found no increase in teen condom use for any period of time.
- C. Only two comprehensive sex education programs succeeded in improving less stringent measures of teen condom use (not CCU) for a period longer than two years, and none lasted beyond three years.

IV. Mathematica Study Limitations—*The Mathematica study, and the four programs it evaluated, cannot be generalized to represent the efficacy of abstinence education or of comprehensive sex education.*

- A. The Mathematica Study Did Not Examine Comprehensive Sex Education Programs: The interpretation some have ascribed to the Mathematica report is that “abstinence programs don’t work, therefore we must provide “safer sex” programs to reduce the risks of early sexual activity.” The Mathematica study did not draw this conclusion, did not examine safer sex programs, nor suggest that they are the obvious default if abstinence programs are not successful. A substantial number of studies have examined condom-based interventions and can inform policy decisions. In summary, of 50 rigorous studies spanning the past 15 years, only one of them reports an improvement in consistent condom use after a period of at least one year.³⁵ This study showed that 58% of females visiting a health clinic for STDs one year after the CCU intervention reported CCU while the control group reported 45%. The other 49 studies either did not measure CCU (the best comparison with abstinent behavior), or did not find a significant program effect of at least one year.³³ This pattern of evidence (1 success out of 49) does not provide a reasonable basis for replacing abstinence education with a condom-based sex education policy.
- B. Cross-contamination of Program Effects: The benefits of a random assignment research design are best realized when the treatment and control group can be kept separate and their integrity can be maintained. In this way, the treatment or “medicine” is not shared between

^c CCU is the behavior upon which the reductions in STDs that are attributed to condom use are based. There is some evidence that inconsistent condom use contributes to increases in STD rates.³⁴ Thus, any condom-based program that does not increase CCU should not be called effective at STD prevention.

the groups. However, in field experiments, this requirement is difficult to achieve, especially with teenagers, and particularly with an intervention that deals with a topic as highly charged as sex. Students randomly assigned to the two groups don't live in these groups—they interact with friends, siblings, and dating partners in the other group. Any new values or behaviors adopted by each group are shared across the groups, and the longer that sharing lasts the more likely it is that the differences between the two groups will disappear as their attitudes, values, beliefs and behaviors merge over time. This cross-group contamination is likely to be a stronger intervention than a typical one-hour-per-day short-term intervention. With almost six years for this spillover effect to operate, this would minimize the measurable differences between the groups, even if the program had successfully reduced the participants' sexual activity. The Mathematic study did not address this problem, nor did it make exception for it in reporting its findings. This limitation and those that follow demonstrate that it requires more than an initial random assignment of participants to claim a “gold standard” study. It also illustrates how difficult it is to do good field studies.

- C. Non-Representative Study Sample: The high-risk population used in the study does not represent the teen population in the U.S. (The majority of the sample were African American youth from poor, single-parent households—see pp. 9 and 20.) The fact that these programs produced no impact on this sample does not indicate whether these same programs would have had an impact on a more representative group of teens.
- D. Unusually Long Follow-up Timeframe: The follow-up time frame employed in this study—2½ to 5½ years after the program end—is too long for *any* type of sex education intervention to have a sustained effect on behavior without interim reinforcement of the program message. We are not aware of *any* evaluations of comprehensive sex education programs that have shown positive changes in teen condom use after three years, and are aware of only two that have shown impact after two years, and these were using the lower standard of success. A myriad of negative influences operate in adolescents' lives to overpower any initial program effect that may have occurred so far in the past. An outcome evaluation with a 5½ year follow-up time period and no interim program reinforcement does not provide a realistic indication of program effectiveness.
- E. Inappropriate Timing of Program Dose: The age group for the interventions in the *Mathematica* study was quite young—elementary and early middle school. Some were as young as 4th and 5th grade. The interventions did not continue, follow-up with, or reinforce the initial treatment during the key years (9th, 10th, 11th grade) when transition into sexual activity typically occurs. Thus, the treatment was not delivered or reinforced when it was most relevant and needed. As stated in the *Mathematica* report “the findings provide no information on the effects programs might have if they were implemented for high school youth or began at earlier ages but served youth through high school” (p. 61). At the outset then, the evaluation started with programs that had little hope of impacting behavior in the long run.
- F. Inadequate Utilization of Mediator Variables: A major disappointment with the study was the insufficient attention given to identifying and tracking the important causal factors that mediate adolescent sexual risk behavior. The study's generic logic model was not tailored to the four specific programs, and therefore the specific theory of these programs was not

tested. Without understanding and monitoring these causal factors, success or failure cannot be understood or explained, intervention modifications can not be made, and longer term program potential cannot be identified. Of the mediating variables they did measure and test, only two showed a significant relationship to the targeted behavior, but neither of them showed significant pre-post change. A more appropriate evaluation model for new and developing programs is one that would share interim data with programs to support their evolution and improvement. In *Mathematica's* case, data was not shared with the programs until four or five years later. Had we taken that approach with some of our own program evaluations, (e.g., Arkansas, Virginia, South Carolina, Georgia) we would likely have seen the same result when measuring behavior five years later. Instead, these projects have evolved and matured overtime, and are now realizing up to 50% reduction in initiation of sexual activity.

V. Evidence of Abstinence Effectiveness—*Several well-designed evaluations of abstinence programs have found significant, long-term reductions in adolescent sexual activity, with both moderate and high-risk populations.*

- A. A randomized controlled trial conducted by Jemmott et al. found that an abstinence-only intervention significantly reduced sexual initiation among young African American adolescents after a 24-month follow-up period, and did not reduce condom use for those virgins who did become sexually active ($p < .05$).³⁶
- B. An abstinence curriculum that was taught in addition to an existing comprehensive sex education program decreased sexual initiation by approximately 40% after 20 months for program students versus comparison students in a high-risk population ($p < .01$).³⁷
- C. An evaluation of the *Reasons of the Heart* abstinence curriculum found that adolescent program participants were approximately one half as likely as the matched comparison group to initiate sexual activity after one year ($p < .05$). The program's effect was as strong for the African American subgroup in the sample as it was overall ($p < .05$).³⁸
- D. A study of the *Heritage Keepers* abstinence program found that one year after program participation virgin middle school students were about one half as likely to initiate sexual activity as the comparison group ($p < .001$). Roughly one half of the sample was African American, for whom the program effect was equally strong ($p < .001$).³⁹
- E. The *Sex Respect* and *Teen Aid* abstinence-only programs reduced the rate of initiation of sex by more than one third ($p < .01$) for the high-risk students in a Caucasian high school sample after 12 months.⁴⁰

VI. Benefits of Abstinence—*Abstinence education offers benefits to adolescents and society that are not found in the comprehensive sex education approach.*

- A. Abstinence provides 100% protection from the biological consequences of sex (pregnancy, abortion, teen parenthood, the full spectrum of STDs).

- B. Youth who abstain can avoid the negative emotional consequences related to teen sex—lowered self-esteem, regret, depression, etc.—as well as reducing the likelihood of experiencing sexual coercion and sexual violence.
- C. Abstinence programs emphasize principles of self-restraint, self-esteem, future goals, long-term commitment, and unselfishness in relationships, and teach healthy relationship skills, all of which support the formation of strong marriages and healthy families.
- D. Several studies have found that teaching abstinence does not reduce rates of condom use for virgin teens who become sexually active.^{36,41}
- E. Abstinence education addresses the relationship of sexuality to the well-being of the whole person, rather than treating sexual activity as an isolated and unrelated behavior.

VII. Programs That Work—*Our research shows, not surprisingly, that some programs work and some don't. The important questions are "which ones do, and why?" Abstinence interventions are most effective if they incorporate what has been learned about how to reduce adolescent sexual risk behavior.*

- A. Well-designed programs target teen attitudes, values, efficacy, and goals regarding abstinence, sexuality, and relationships, as key mediators of sexual behavior.
- B. The classroom teacher plays a crucial role in the process of changing teen attitudes and behaviors about sexuality through his/her personal example, mentoring, and teaching skills.
- C. Successful programs utilize a variety of instructional methods that include interactive participatory activities, role playing, skill-building, personal application, and commitment.
- D. An initial program installment of 20 hours of instruction, repeated annually, and followed by regular reinforcement of the abstinence message is the minimum dose recommended to facilitate an increase in teen sexual abstinence.
- E. Well-designed abstinence interventions will contain a strong parent component that includes direct parent instruction and "homework" assignments to facilitate parent-teen interaction about abstinence.

CONCLUSIONS

Well-designed and well-implemented abstinence education programs can reduce teen sexual activity by as much as one half for periods of one to two years, substantially increasing the number of adolescents who avoid the full range of problems related to teen sexual activity. Abandoning this strategy because of one study containing numerous limitations and shifting to a strategy that has shown little success across a broad range of studies, would appear to be a policy driven by politics rather than by a desire to protect American teens.

REFERENCES

1. Trenholm, C., Devaney, B., Fortson, K., Quay, L., Wheeler, J., & Clark, M. (2007). Impacts of Four Title V, Section 510 Abstinence Education Programs. Princeton, NJ: Mathematica Policy Research, Inc. April 2007.
2. SIECUS. (2007). Press Release: Federal abstinence-only-until-marriage programs not proven effective in delaying sexual activity among young people. April 13, 2007. Available at: <http://www.siecus.org/media/press/press0141.html>.
3. Eaton, D.K., Kann, L., Kinchen, S., Ross, J., Hawkins, J., & Harris, W.A. (2006). Youth Risk Behavior Surveillance—United States, 2005. *MMWR Surveillance Summaries*, June 9, 2006/55(SS05);1–108. Retrieved Jan. 12, 2007 from <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5505a1.htm>.
4. Guttmacher Institute. (2006). U.S. Pregnancy Statistics: National and State Trends and Trends by Race and Ethnicity. New York: Author. September, 2006.
5. Hofferth, S.L., & Reid, L. (2002). Early childbearing and children's achievement and behavior over time. *Perspectives on Sexual and Reproductive Health*, 34(1):41–49.
6. Jaffee, S.R. (2002). Pathways to adversity in young adulthood among early childbearers. [Electronic version] [Abstract]. *Journal of Family Psychology*, 16, 38–49.
7. Maynard, R.A. (Ed.) (1997). Kids having kids: Economic costs and social consequences of teen pregnancy. Washington, DC: The Urban Institute. Cited in *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy*, Kirby, 2001.
8. Miller, B.C., & Moore, K.A. (1990). Adolescent sexual behavior, pregnancy, & parenting: Research through the 1980s. *Journal of Marriage & the Family*, 52, 1025–1044.
9. Warren, C.W., Kann, L., Small, M.L., Santelli, J.S., Collins, J.L., & Kolbe, L.J. (1997). Age of Initiating Selected Health-Risk Behaviors among High School Students in the United States. *Journal of Adolescent Health*, 21, 225–231.
10. American Social Health Association. (1998). *Sexually Transmitted Diseases in America: How Many Cases and a What Cost?* Menlo Park, CA.: Kaiser Family Foundation. Retrieved October 6, 2003, from http://www.kff.org/content/archive/1445/std_rep.html.
11. Centers for Disease Control and Prevention. (2001). *Tracking the Hidden Epidemics 2000: Trends in STDs in the United States*. Atlanta, GA: U.S. Department of Health and Human Services, July, 2001. Retrieved March 12, 2003, from <http://www.cdc.gov/nchstp/od/news/RevBrochure1pdfintro.htm>.
12. National Institute of Allergy and Infectious Diseases (NIAID). (2001). *Workshop Summary: Scientific Evidence on Condom Effectiveness for Sexually Transmitted Disease (STD) Prevention*. July 20, 2001. Washington, DC: National Institutes of Health, Department of Health and Human Services.
13. Sulack, P.J. (2003). Sexually transmitted diseases. *Seminars in reproductive medicine*, 21 (4): 399–413.
14. Centers for Disease Control and Prevention. (2003a). *Sexually Transmitted Disease Surveillance, 2002*. Atlanta, GA: U.S. Department of Health and Human Services, September 2003. Retrieved February 9, 2004, from <http://www.cdc.gov/std/stats/tables/table12B.htm>.
15. Centers for Disease Control and Prevention. (2003b). *Fact Sheet—Young People at Risk: HIV/AIDS Among America's Youth*. Division of HIV/AIDS Prevention. Atlanta, GA: U.S. Department of Health and Human Services. Retrieved June 24, 2003, from <http://www.cdc.gov/hiv/pubs/facts/youth.htm>.
16. Fortenberry, J.D. (2002). Unveiling the hidden epidemic of sexually transmitted diseases [Electronic version]. *Journal of the American Medical Association*, 287, 768–769.
17. Chesson, H.W., Blandford, J.M., Gift, T.L., Tao, G., & Irwin, K.L. (2004). The estimated direct medical cost of sexually transmitted diseases among American youth, 2000. *Perspectives on Sexual and Reproductive Health*, 2004, 36(1):11–19.
18. Hallfors, D.D., Waller, M.W., Ford, C.A., Halpern, C.T., Brodish, P.H., & Iritani, B. (2004). Adolescent depression and suicide risk: association with sex and drug behaviors. *American Journal of Preventive Medicine*, 27:224–230.
19. Rector, R., Johnson, K., & Noyes, L. (2003). Sexually Active Teenagers are More Likely to be Depressed and to Attempt Suicide. *Heritage Foundation Center for Data Analysis 2003: Report #03-04*. Available at <http://www.heritage.org/Research/Family/cda0304.cfm>. Accessed June 5, 2003.
20. Bearman, P.J., & Bruckner, H. (2001). Promising the future: virginity pledges and the transition to first intercourse. *American Journal of Sociology*, 106:859–912.
21. National Campaign to Prevent Teen Pregnancy. (2003). *America's Adults and Teens Sound Off About Teen Pregnancy: An Annual National Survey*. December 2003. Washington DC: Author. Retrieved January 5, 2004, from <http://www.teenpregnancy.org>.
22. Moore, K., & Manlove, J. (2005) A demographic portrait of statutory rape. Presentation to Conference on Sexual Exploitation of Teens. March 2005. Washington, DC: Child Trends. Accessed October 30, 2006 at: [Statutory rape-final version sent to OPA.ppt](#).
23. Silverman, J.G., Raj, A., & Clements, K. (2004). Dating violence and associated risk and pregnancy among

- adolescent girls in the United States. *Pediatrics*, 114(2), e220–225.
24. Weller, S., & Davis, K. (2002). Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev*, 1. [Abstract].
25. Winer, R.L., Hughes, J.P., Feng, Q., O'Reilly, S., Kiviat, N.B., Holmes, K.K., & Koutsky, L.A. (2006). Condom use and the risk of genital human papillomavirus infection in young women. *New England Journal of Medicine*, 354:2645–54.
26. Crosby, R.A., DiClemente, R.J., Wingood, G.M., Lang, D., & Harrington, K.F. (2003). Value of consistent condom use: A study of sexually transmitted disease prevention among African American adolescent females. *American Journal of Public Health*, 93:901–2. [In Holmes, et al., 2004—see Reference #18.]
27. Wald, A.; Langenberg, A.G.; Link, K.; Izu, A.E.; Ashley, R.; Warren, T.; Tyring, S.; Douglas, J.M. Jr., & Corey, L. (2001). Effect of condoms on reducing the transmission of herpes simplex virus type 2 from men to women. *Journal of the American Medical Association*, 285(24):3100–06.
28. Centers for Disease Control and Prevention. Teenagers in the United States: Sexual Activity, Contraceptive Use, and Childbearing, 2002 (online). *Vital Health Stat 23, Number 24*. Hyattsville, Maryland: U.S. Department of Health and Human Services, December, 2004. Available at: http://www.cdc.gov/nchs/data/series/sr_23/sr23_024.pdf. Accessed December 16, 2004.
29. Thomas, M. (2000). Abstinence-based programs for prevention of adolescent pregnancies: A review. *Journal of Adolescent Health*, 26, 5–17.
30. Kirby, D. (2002). *Do Abstinence-Only Programs Delay the Initiation of Sex Among Young People and Reduce Teen Pregnancy?* Washington, DC: National Campaign to Prevent Teen Pregnancy.
31. Manlove, J.M., Terry-Humen, E., Papillo, A., Franzetta, K., Williams, S., & Ryan, S. (2002). Preventing teenage pregnancy, childbearing, and sexually transmitted diseases: What the research shows. In Child Trends & John S. and James L. Knight Foundation (Eds.), *American teens: A special look at "what works" in adolescent development* (pp. 6–23). Washington, DC: Child Trends.
32. Scher, L.S., Maynard, R.A., & Stagner, M. (2005). Interventions intended to reduce pregnancy-related outcomes among adolescents. (Unpublished manuscript, June 30, 2005)
33. Kirby, D., Laris, B.A., & Roller, L. (2006). The impact of sex and HIV education programs on sexual behaviors of youth in developing and developed countries. *Youth Research Working Paper Series, No.2*, Family Health International.
34. Holmes, K.K., Levine, R., & Weaver, M. (2004). Effectiveness of condoms in preventing sexually transmitted infections. *Bull World Health Organ*, 82(6):454–461.
35. DiClemente, D.J., Wingood, G.M., Harrington, K.F., Lang, D.L., Davies, S.L., Hook III, E.W., et al. (2004). Efficacy of an HIV prevention intervention for African American adolescent girls: a randomized controlled trial. *Journal of the American Medical Association*, 292, 171–9.
36. Jemmott III, J.B., Jemmott, L.S., & Fong, G.T. (2006). Efficacy of an abstinence-only intervention over 24 months: a randomized controlled trial with young adolescents. Presentation at XVI International AIDS Conference, Toronto, Canada; Aug. 13–18, 2006.
37. Howard, M., & McCabe, J.B. (1990). Helping teenagers postpone sexual involvement. *Family Planning Perspectives*, 22, 21–26.
38. Weed, S.E., Ericksen, I.H., Lewis, A., Grant, G.E., & Webberly, K.H. (2007). An Abstinence Program's Impact on Cognitive Mediators and Sexual Initiation. *American Journal of Health Behavior* (in press).
39. Weed, S.E., Ericksen, I.H., Birch, P.J. (2005). An evaluation of the *Heritage Keepers Abstinence Education* program. In Golden A (Ed.) *Evaluating Abstinence Education Programs: Improving Implementation and Assessing Impact*. Washington DC: Office of Population Affairs and the Administration for Children and Families, Department of Health & Human Services, 2005:88–103.
40. Olsen, J.A., Weed, S.E., Daly, D., Jensen, L. (1992). The effect of abstinence sex education programs on virgin versus nonvirgin students. *Journal of Research and Development in Education*, 25:69–75.
41. Borawski, E.A., Trapl, E.S., Lovegreen, L.D., Colabianchi, N., & Block, T. (2005). Effectiveness of abstinence-only intervention in middle school teens. *American Journal of Health Behavior*, 29:423–434.