

# Predicting Preferences for Types of Sex Education in US Schools

Amy Bleakley · Michael Hennessy · Martin Fishbein

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**Abstract** The authors examined how support for abstinence-only education, comprehensive sex education, and condom instruction in US schools was related to beliefs about their respective efficacy, as well as how policy preferences were related to demographic, political, and social variables such as political orientation, attendance at religious services, and having an adolescent in the household. The authors used structural equation modeling to analyze survey data from a nationally representative sample of adults 18 years of age and older. Frequency of attendance at religious services and political orientation were associated with policy preferences directly and indirectly through their influence on beliefs about the educational efficacy of each approach. Having an adolescent in the household, age, and region of the country were not associated with any of the mediating beliefs or outcomes. Religious and political factors emerged as key characteristics in explaining support or opposition to different sex education approaches in the United States.

**Keywords** Abstinence-only education · Comprehensive sex education · Public opinion · Condom instruction · Adolescents

## Background

Most scientific and public discourse on sex education programs in the United States is focused on the appropriateness and efficacy of abstinence-only education programs. Abstinence-only education teaches youth to wait until marriage to have sex (U.S. Social Security Administration 2007) and received \$176 million in federal funding in fiscal year 2007 (Sexuality Information and Education Council of the United States 2008). In general, such programs emphasize the failure rates of condoms (Human Rights Watch 2004; Kantor et al. 2008; Lin and Santelli 2008) and are inherently biased against homosexual youth for whom marriage is generally not an option (Miller and Schleifer 2008; Santelli et al. 2006; Santelli and Kantor 2008). Some scholars have also argued that abstinence-only programs violate human rights by denying youth access to accurate medical information (Santelli et al. 2006; Santelli & Kantor 2008). Alternatively, comprehensive sex education curricula, also referred to as abstinence-plus programs, provide information about abstinence as well as about contraception and condoms.

Empirical evidence indicates that abstinence-only education programs are not effective in delaying sexual initiation and preventing sexually transmitted diseases (STDs) and pregnancy (Kirby 2007, 2008; Kohler et al. 2008; Trenholm et al. 2007, 2008). One randomized control trial (Jemmott et al. 1998) did demonstrate short-term effects of an abstinence-only curriculum in delaying initiation at the 3-month follow-up, but the effects disappeared at subsequent observations. An observational study (Brückner and Bearman 2005) suggested that youth who made virginity pledges, often a feature of abstinence-only education programs, may be at higher risk for STDs

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A. Bleakley (✉) · M. Hennessy · M. Fishbein  
Annenberg Public Policy Center,  
3620 Walnut Street,  
Philadelphia, PA 19104, USA  
e-mail: ableakley@asc.upenn.edu

M. Hennessy  
e-mail: mhennessy@asc.upenn.edu

M. Fishbein  
e-mail: mfishbein@asc.upenn.edu

because they are less likely to use a condom the first time they do have sex—although infection rates between pledgers and nonpledgers did not differ. Scientific studies have shown, however, that comprehensive sex education is associated with the delayed initiation of sex, reduced number of sexual partners, and increased condom use (Kirby 2007).

Accumulating scientific evidence that demonstrates the positive effects of comprehensive sex education and the null or even negative effects of abstinence-only education increasingly calls into question the scientific basis of an abstinence-only approach. In response, states have begun to reject federal funding for abstinence-only education so that they can offer evidence-based comprehensive sex education programs. As of January 2009, 28 states have rejected such funding (Sex, etc. 2009).

Although public-opinion research has demonstrated support for comprehensive sex education among the general public (Albert 2004; Bleakley et al. 2006; National Public Radio, Henry J. Kaiser Family Foundation, and Harvard University John F. Kennedy School of Government 2004) and especially among parents (Constantine et al. 2007; Eisenberg et al. 2008; Ito et al. 2006), little is known about what factors are associated with support for or opposition to comprehensive sex education and abstinence-only education programs. In a survey of parents in Minnesota, Eisenberg and colleagues found differences in support for comprehensive sex education by religious affiliation, child enrollment in public school, political orientation, and income. However, a survey of California parents (Constantine et al. 2007) showed little variation in support for comprehensive sex education by religious attendance and political orientation. Furthermore, the authors suggested that differences in support are guided by pragmatic versus absolutist reasons for support or opposition. Pragmatic reasons include focusing on providing full and complete information to adolescents and the inevitability of teens having sex, whereas absolutist reasons focus on religious beliefs or moral principles (Constantine et al. 2007).

The aforementioned studies are specific to particular states, took place in different regions of the country, and included only parents as the respondents. Because we wanted to determine whether these patterns would persist among a national sample of all adults of voting age, as well as among those with adolescent children, we examined how several demographic, social, and political factors shaped preferences for sex education programs in a national sample of US adults. Understanding the factors associated with these preferences allows health education professionals and policymakers to identify characteristics that contribute to opinion formation regarding sex education.

## Theoretical Framework for Policy Preferences

In the model we present here, the effects of demographic, social, and political factors on sex education policy preferences are assumed to be partially mediated by beliefs about the educational efficacy and outcomes of the various sex education programs. This approach is consistent with theories such as the “integrative model” (Fishbein 2000), which assumes that background factors influence attitudes (and, subsequently, behavior) indirectly through their influence on more specific beliefs (Ajzen and Albarracín 2007). Because policy preferences are often considered to be attitudes in the context of political surveys (Zaller 1992), a mediated model is an appropriate way of demonstrating how background factors and beliefs determine policy preferences. Fortunately, structural equation modeling provides a convenient way to analyze mediated models and to disaggregate causal pathways into direct and indirect effects (Holbert and Stephenson 2003; Kline 2005).

Figure 1 shows the generic model of policy preference formation. The policy preferences are indicated by three items measuring support for abstinence-only education, comprehensive sex education, and condom instruction in schools. As shown, we presume a model in which the effects of demographic and social variables on policy preferences are mediated by beliefs about sex education. The belief items refer to respondents' agreement with statements about outcomes of the different sex education programs. More specifically, participants were asked whether abstinence-only and comprehensive sex education programs are effective ways of preventing unwanted pregnancies, as well as whether condom instruction encourages sex. The mediating beliefs are considered antecedents to each of the policy preferences and are themselves viewed as being influenced by the following factors: attendance at religious services, political orienta-

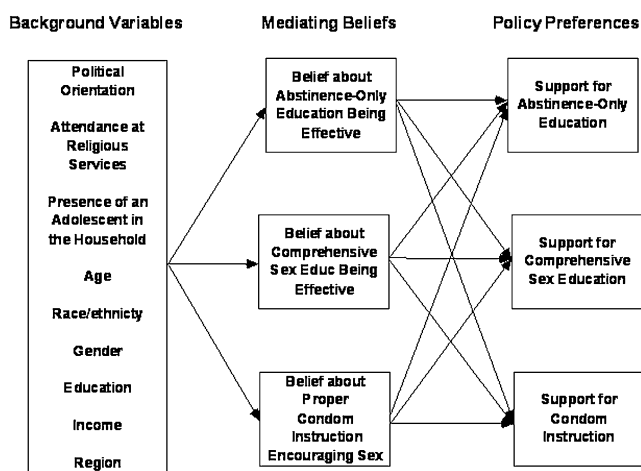


Fig. 1 Generic model of support for sex education policies

tion, race or ethnicity, age, gender, education level, income level, region of the country, and presence of an adolescent in the household.

Our model is only partially mediated because it assumes direct paths from three of the demographic and social variables—political orientation, attendance at religious services, and the presence of an adolescent in the household—to the policy outcomes. Previous research (see Bleakley et al. 2006) has shown differences in policy preferences by political orientation and attendance at religious services. We hypothesized that these three paths would not be fully mediated by the beliefs because they would most likely be related to other beliefs that were not measured in the survey. For example, respondents might think a particular sex education program is efficacious but immoral, and therefore they might not support the program. Political orientation might be related to beliefs about the appropriate role of the federal government in teaching adolescents about sex, views that would not necessarily be related to beliefs about the relative efficacy of abstinence-only or comprehensive sex education in preventing pregnancy or delaying sexual behavior.

## Method

### Sample

The Annenberg National Health Communication Survey (Knowledge Networks 2007) is a nationally representative, repeated cross-sectional survey with a sample universe of all people 18 years and older living in the United States. The online survey is administered by the survey research firm Knowledge Networks using list-assisted, random-digit-dialing telephone methodology to provide a probability-based starting sample of US telephone-accessible households. Thus, the sampling design uses random-digit-dialing methodology, but the surveys are completed online once a participant is enrolled. Potential respondents are called and asked to participate in a panel maintained by Knowledge Networks. Throughout their enrollment as part of the panel, respondents received multiple surveys covering a range of topics. Recruited panel members who did not have a computer or access to the Internet were provided with a WebTV box and free monthly Internet access.

The provision of a computer and Internet access to participating households who need them allows for consistent delivery of the survey content and prevents biasing the sample in favor of current Internet users or computer owners. The demographics of the web-enabled panel were similar to those of the US population in terms of age, race, Hispanic ethnicity, geographic region, employment status, and other demographic elements. Panel recruitment

response rates vary by the month of data collection; they ranged from 26% to 31% during July 2005 through January 2006, when data for this study were collected (Knowledge Networks 2007). These response rates represent the percentage of new members who were recruited for participation into the Knowledge Networks survey panel.

A sample is drawn each month from participating households. Survey completion rates range from 73% to 76%. The survey features a core set of items answered by the entire sample, as well as modules randomly assigned to half the sample. The variables used in this analysis were part of the noncore modules and resulted in a total sample of 1,096 respondents. Data were collected on a range of social and demographic characteristics, including whether respondents had an adolescent child, as well as political ideology, attendance at religious services, US region of residence (Northeast, Midwest, South, West), age, sex, and race or ethnicity. The main variables of interest were beliefs and policy preferences concerning sex education in the schools.

### Measures

*Policy Preferences for Sex Education* Three measures assessed policy preferences for sex education in schools by using a 5-point scale (from -2 to 2) of “strongly oppose” to “strongly support”. The measures each represented a different type of sex education: abstinence-only, comprehensive, and comprehensive including condom instruction. The survey items were as follows: “Do you support or oppose sex education programs in schools in your community that teach abstinence only? Abstinence-only education promotes abstinence until marriage and does not teach students about other methods of preventing pregnancy and sexually transmitted diseases”; “Do you support or oppose sex education programs in schools in your community that teach students about other methods of preventing pregnancy and sexually transmitted diseases in addition to teaching about abstinence?”; and “Do you support or oppose sex education programs in schools in your community that include instruction on how to use condoms properly to prevent pregnancy and sexually transmitted diseases?”

*Beliefs About Sex Education* Respondents were also asked about their beliefs or expectations concerning the educational efficacy of different sex education approaches. They answered three items regarding their beliefs about sex education (“disagree” to “agree”, scale -2 to 2): “Abstinence-only education is an effective way of preventing teens from having unplanned pregnancies”; “Sex education that teaches about abstinence and other methods of preventing pregnancy is an effective way of preventing teens from having unplanned

pregnancies”; and “Teaching teens how to properly use a condom encourages them to have sex.”

**Demographic and Social Characteristics** The presence of at least one adolescent ages 13–17 years in the household was measured by a dichotomous yes–no response. Race or ethnicity was reported as one of four categories: White, non-Hispanic; African American, non-Hispanic; other, non-Hispanic; and Hispanic. Education was measured as a 4-point ordinal measure: less than high school, high school, some college, or bachelor's degree or higher. Income level was reported as an ordinal measure with seven categories, each in increments of \$10,000: less than \$15,000; \$15,000–\$24,999; and so on, until \$100,000 or more. Region was classified into the four US Census categories of Northeast, Midwest, South, and West. Political ideology was self-reported and measured on a 7-point scale from “extremely liberal” to “extremely conservative”, with moderates at the midpoint. For the purposes of analysis, political ideology was collapsed into three groups: liberals, moderates, and conservatives. Attendance at religious services, often used as an indicator of religiousness, was a six-level ordinal estimate of attending religious services ranging from “never” to “more than once a week”. Dummy variables were used in the regression analysis for race and ethnicity (referent group=White), education level (referent group=high school graduate), region (referent group=Midwest), and political orientation (referent group=moderates).

### Statistical Analyses

First, we conducted equivalency tests on the means, variances, and covariances of the belief and policy preference variables to justify pooling the data across months. Fit statistics that assume no difference between months were consistent with the assumption of no change over time: Chi-square=26.143,  $df=24$ ,  $p=0.346$ ;  $RMSEA=0.009$ ; and  $TLI=0.996$ . For information on these types of goodness-of-fit indexes, see Kline (2005). Next, we calculated descriptive statistics on the mediating (i.e., beliefs about sex education) and outcome (i.e., policy preferences for sex education) variables of interest. Finally, we used structural equation modeling to estimate the effects of social and demographic characteristics on mediating beliefs and policy preferences for sex education.

We used the Mplus program (Muthén and Muthén 2006) to analyze the survey data because the dependent variables were ordinal or dichotomous. For ordinal variables, Mplus implements a weighted mean and variance estimator that has been shown to have excellent statistical qualities even with small samples (Flora and Curran 2004). The estimator

assumes a probit (i.e.,  $Z$  score) metric on the unobserved latent variables, so all dependent variables are assumed to have unit variance. We used the diff-test command, which calculates a Chi-square test statistic to test whether our mediated model was appropriate compared with a saturated model with direct paths from the exogenous demographic variables to the policy preferences. We correlated the error terms among the mediating belief variables and also among the policy preference outcomes. We had no specific theory about causal ordering among the beliefs and among the outcomes; thus, an appropriate structural equation modeling approach here is to estimate the correlations between error terms only (Preacher and Hayes 2008).

## Results

### Sample

Table 1 presents descriptive statistics on the study sample. The race–ethnicity distribution of our sample was consistent with the latest US Census estimates. According to the 2000 census, 72.7% of adults age 18 years or older were White, non-Hispanic; 11.2% were African American, non-Hispanic; 11.0% were Hispanic (all races); and 4.5% were other, non-Hispanic (U.S. Census Bureau 2000). In addition, the political orientation of respondents was consistent with self-reported ideological identification in several national surveys (e.g., American National Election Studies, n.d.; Romer et al. 2006).

### Sex Education Beliefs and Policy Preferences

Figure 2 shows the distribution of responses to the sex education beliefs and policy preference items. As shown in the figure and previously reported (Bleakley et al. 2006), a majority (82%) of the sample supported (either somewhat or strongly) comprehensive sex education. More variation was apparent in support for abstinence-only education: of the respondents, 36% were supportive and 51% opposed (the remaining had no opinion). With respect to condom instruction, 68% of the sample supported this educational approach, whereas 21% were opposed. We found very similar patterns of responses with respect to the beliefs about each type of education program. That is, the distribution of support for a particular sex education program was similar to the distribution of support for the mediating belief that concerned that type of program.

### Structural Equation Modeling: Regression Analyses

Table 2 presents regression results and model fit statistics. Model fit statistics indicated a good fit of the model. Beliefs

**Table 1** Descriptive statistics on demographic and social factors

	Sample characteristics <i>N</i> =1,096
<b>Race or ethnicity</b>	
African American	9.6%
White	78.7%
Hispanic	7.6%
Other	4.1%
<b>Presence of adolescent in household</b>	
Male	46.4%
Age (18–83 years)	46.8 (15.9) <sup>a</sup>
<b>Education level</b>	
Less than high school	12.9%
High school	30.3%
Some college	27.7%
College degree or higher	29.1%
<b>Income</b>	
Less than \$15,000	13.1%
\$15,000–\$24,999	12.1%
\$25,000–\$34,999	12.3%
\$35,000–\$49,999	20.2%
\$50,000–\$74,999	20.7%
\$75,000–\$99,999	11.1%
\$100,000 or more	10.5%
<b>Region</b>	
Northeast	18.1%
Midwest	24.7%
South	34.8%
West	22.4%
<b>Religious attendance</b>	
Never	20.3%
Once a year or less	16.5%
A few times a year	20.6%
Once or twice a month	10.6%
Once a week	21.4%
More than once a week	10.6%
<b>Political orientation</b>	
Conservative	35.5%
Moderate	39.5%
Liberal	25.0%

<sup>a</sup> Mean (standard deviation)

about the effectiveness of abstinence-only education and about condom instruction were largely driven by attendance at religious services and by political orientation. Agreement with the belief that abstinence-only education was effective was positively associated with increased attendance at religious services and with being of a conservative political orientation (compared with moderates). In contrast, religious attendance and being politically conservative were negatively

associated with the belief that condom instruction does not encourage youth to have sex. Those who were politically conservative and had higher income levels were less likely to believe that comprehensive sex education was an effective way to reduce teen pregnancy. No other predictors were associated with the belief item regarding comprehensive sex education (most likely because, as shown in Fig. 2, this belief has limited variance).

In general, few demographic characteristics were associated with the mediating beliefs. The notable exceptions were race, education, and income. Compared with high school graduates, respondents with a college degree or higher were less likely to believe that abstinence-only is an effective way to prevent pregnancy and more likely to believe that condom instruction does not encourage sex. African Americans, those of other race or ethnicity, males, and lower-income respondents were more likely to believe that abstinence-only education was an effective means of preventing teen pregnancy.

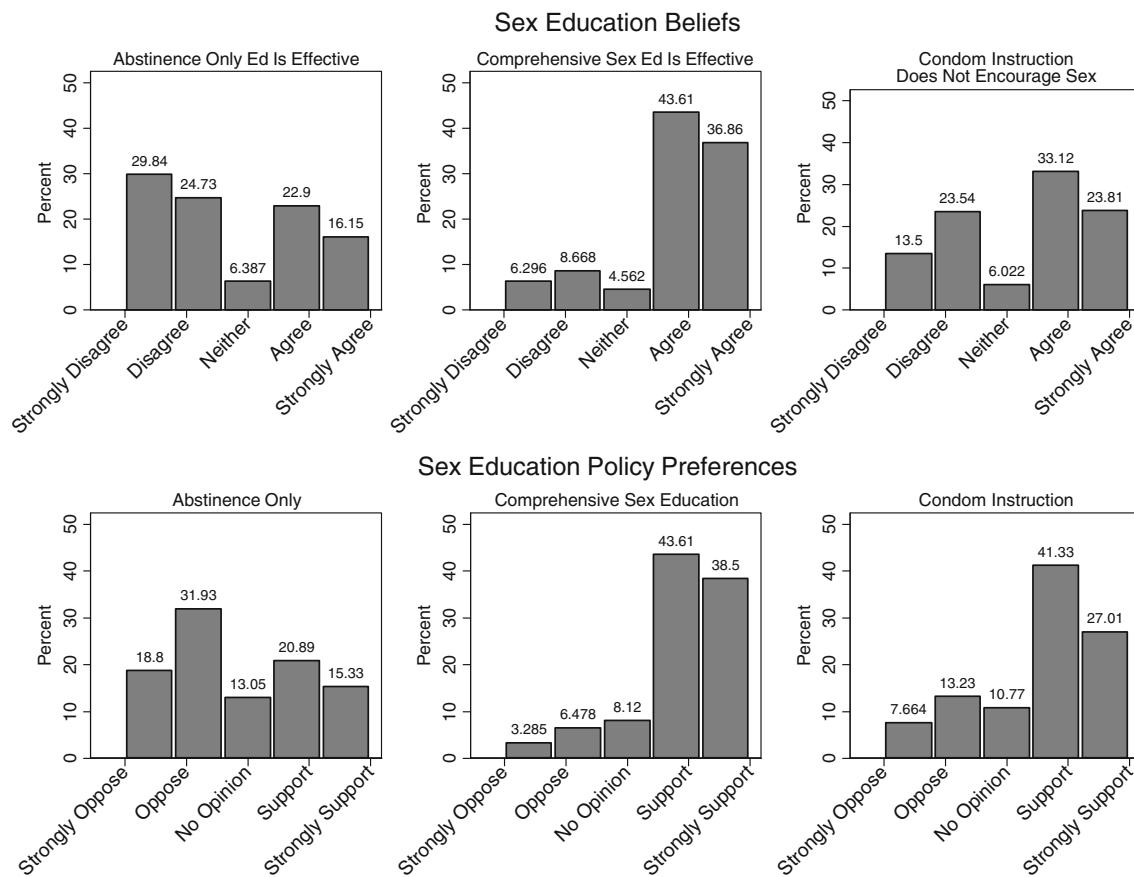
#### Predictors of Policy Outcomes

The only factors significantly associated with support for abstinence-only education were the belief that abstinence-only is an effective way to prevent pregnancy and attendance at religious services. In contrast, attendance at religious services was associated with less support for condom instruction. Additionally, a liberal political orientation and the belief that condom instruction does not encourage sex were associated with increased support for condom instruction. Increased support for condom instruction was also positively associated with the belief that abstinence-only education is ineffective.

The three mediating beliefs items were all significantly associated with support for comprehensive education in the expected directions. That is, agreement with the belief that abstinence-only is effective was associated with less support for comprehensive sex education, whereas the beliefs that comprehensive sex education is effective and that teaching condom skills does not encourage sex were positively associated with support for comprehensive sex education. Having an adolescent in the household was not significantly associated with any of the mediating beliefs or with any of the policy outcomes. This model explained 44% of the variance in support for abstinence-only education, 50% for comprehensive sex education, and 57% for condom instruction support.

#### Test of Mediation

To determine whether our assumptions about (partial) mediation through the belief items were justified, we used the Chi-square test to compare the mediated model to a



**Fig. 2** Distribution of sex education beliefs and policy preferences ( $N=1,096$ )

fully saturated model that had direct paths from all the demographic variables to the belief items and to the policy preferences. The Chi-square test for differences between the saturated and the mediated (i.e., nested) models was nonsignificant ( $\chi^2=30.41$ ,  $df=24$ ;  $p=0.17$ ), indicating that it was appropriate to remove the direct paths from the demographic variables (i.e., age, race, sex, education, income, and region) to the policy preferences as shown in Fig. 1. As previously mentioned, we kept direct paths from political orientation, attendance at religious services, and presence of an adolescent in the household because we believed that the effects of these variables would not be completely mediated by our specific belief items.

## Discussion

This study provides insight into the types of demographic and social factors that help shape underlying beliefs and policy preferences about school sex education programs. In summary, religious and political factors emerged as key characteristics in explaining support for or opposition to different sex education approaches in the United States. Frequency of attendance at religious services and political

orientation were associated with policy preferences directly and indirectly through their influence on beliefs about the educational efficacy of each approach. Having an adolescent in the household, age, and region of the country were not associated with any of the mediating beliefs or outcomes. This result is surprising because it is reasonable to think that having an adolescent child might affect one's opinion about how teens should be instructed about sex. The effects of age and region may have been absorbed by other demographics, such as political orientation. Also, race and gender effects were only apparent with respect to the belief that abstinence-only education is an effective means of preventing pregnancy. Generally speaking, compared with political orientation and religious attendance, standard demographic characteristics did not account for much of the variance in respondents' beliefs about sex education.

These findings make clear that support for abstinence-only education, comprehensive sex education, or condom instruction is largely related to beliefs about whether such programs are effective in preventing unplanned pregnancy among teenagers. The belief regarding abstinence-only education as effective stands out as having the most differences; those who attend religious services, more

**Table 2** Results of regression analysis on sex education beliefs and policy preferences

Predictors	Dependent variables <i>N</i> =1,096					
	Belief about AOE	Belief about CSE	Belief about CI	Support for AOE	Support for CSE	Support for CI
Belief that AOE is effective	–	–	–	0.583**	–0.322**	–0.204**
Belief that CSE is effective	–	–	–	–0.051	0.352**	0.260
Belief that CI does not encourage sex	–	–	–	–0.081	0.283**	0.434**
Religious attendance	0.206**	–0.034	–0.121**	0.110*	–0.075	–0.195**
Liberal political orientation	–0.099*	0.025	0.077	0.028	0.074	0.143**
Conservative political orientation	0.155**	–0.103*	–0.176**	–0.004	–0.052	0.001
Presence of adolescent in household	–0.014	0.035	–0.013	0.057	0.038	0.010
African American	0.089*	0.080	0.003			
Hispanic	–0.030	0.023	0.033			
Other	0.094*	0.024	–0.057			
Male	0.078**	–0.027	–0.027			
Age	–0.018	0.029	0.002			
Less than high school	–0.016	–0.053	–0.059			
Some college	0.016	0.015	–0.046			
College degree or higher	–0.220**	0.024	0.132**			
Income	–0.086*	–0.092*	0.026			
Northeast	–0.071	–0.019	0.024			
South	–0.024	–0.039	0.005			
West	–0.064	–0.008	0.005			
<i>R</i> -squared	0.20	0.04	0.11	0.44	0.50	0.57
Goodness-of-fit statistics	$\chi^2=30.411$ , <i>df</i> =24, <i>p</i> =0.17; <i>RMSEA</i> =0.02; <i>TLI</i> =0.992					
Correlation of error terms ( <i>r</i> ):	Abstinence-only belief with comprehensive sex belief <i>r</i> =0.102					
	Abstinence-only belief with condom instruction belief <i>r</i> =–0.525					
Mediating beliefs	Comprehensive sex education belief with condom instruction belief <i>r</i> =0.041					
Correlation of error terms ( <i>r</i> ):	Abstinence-only policy preference with comprehensive sex policy preference <i>r</i> =0.235					
Policy preferences	Abstinence-only policy preference with condom instruction policy preference <i>r</i> =0.191					
	Comprehensive sex policy preference with condom instruction policy preference <i>r</i> =0.850					

AOE denotes abstinence-only education; CSE denotes comprehensive sex education; CI denotes condom instruction. Coefficients are probabilities and are the change in the *Z* score of the dependent variable given a one-unit change in the predictor.

\**p*<0.05; \*\**p*<0.01.

frequently, are less liberal and more conservative, are of African American or other race or ethnicity, are male, not college-educated, and report low income are most likely to agree that abstinence-only education is effective against preventing unplanned pregnancies. In contrast, the 87% of respondents supporting comprehensive sex education showed little variation in either support for this policy or in the underlying belief that comprehensive sex education is an effective means of preventing pregnancy.

This study is not without limitations. First, some variables that may be associated with our outcomes, such as religious affiliation and identification as an Evangelical, were not considered in our analysis. Also, it would have been beneficial to include more than one belief item for each type of sex education program. Such beliefs might

include, for example, the role of the government in sex education, whether teens should have sex before marriage, if condoms should be made available in schools, and so on. Finally, because the data are cross-sectional, conclusions about causation cannot be drawn. However, it would not be logical to assume that the policy outcomes or beliefs causally precede many of the demographics and social characteristics used in the analysis (e.g., race, gender, education).

Our findings suggest that health educators, advocates, and policymakers may want to target beliefs about program efficacy when they intervene on behalf of comprehensive sex education programs. We are not suggesting that accurate information or knowledge alone would sway beliefs or preferences, particularly given the strong religious and political nature of the debate concerning support for, or

opposition to, different types of sex education programs. However, perhaps focusing the debate on the extent to which different programs prevent pregnancies and STDs in adolescents will shift the political tone of the current discourse to a more public-health-oriented perspective based on evidence rather than ideology.

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