PUBLIC OPINION ABOUT AIDS POLICIES

THE ROLE OF MISINFORMATION AND ATTITUDES TOWARD HOMOSEXUALS

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Abstract In an effort to better understand the cognitive and attitudinal factors underlying public opinion on AIDS-related issues, this article proposes and empirically tests a model of the relationships between (1) knowledge of HIV transmission, specifically the misinformation that AIDS can be transmitted easily through casual contact with HIV-infected persons; (2) attitudes toward homosexuals, the most prominent of the social groups presently affected by the AIDS crisis; and (3) support for restrictive public policies aimed at HIV-infected persons. Data from two nationally representative surveys conducted in December of 1985 (N = 2,308) and in July of 1987 (N = 2,095) provide evidence that misinformation about AIDS transmission and negative attitudes toward homosexuals are strong predictors of support for stringent restrictions of persons with AIDS. The findings also suggest that several background factors, in particular, education and political liberalism, may also play decisive roles in influencing levels of support for restricting those infected with the AIDS virus.

The spread of acquired immunodeficiency syndrome (AIDS) through the transmission of the human immunodeficiency virus (HIV) was first recognized as a pressing public health problem in the early 1980s. Since 1983, survey research in the United States has helped document aggregate trends in AIDS-related knowledge, attitudes, and behaviors,

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Public Opinion Quarterly Volume 56:29–52 0033-362X/92/5601-0007$02.50

as well as opinion preferences on policies aimed at combating the disease (e.g., Blake and Arkin 1988; Singer 1989; Singer, Rogers, and Corcoran 1987). By and large, this work has suggested that although scientifically demonstrated routes of HIV transmission (through intimate sexual contact, sharing needles, and blood transfusions) are well understood by the public, there is nonetheless a persistent belief among substantial portions of the public that AIDS can also be transmitted through a variety of casual routes (e.g., by working alongside HIV-infected persons, shaking hands, being sneezed on, etc.). Recently, for example, the National Center for Health Statistics estimated from their September 1990 National Health Interview Survey that 24 percent of the public thinks it is "very likely" or "somewhat likely" that someone would contract AIDS from eating in a restaurant where the cook has the AIDS virus, while 19 percent believes it is "very" or "somewhat likely" that they would contract AIDS from using public toilets (Adams and Hardy 1991).

These findings are of concern to public health policy officials for at least two important reasons. First, basic knowledge about HIV and how it is transmitted is an essential precursor to reasonable and safe personal health practices, which are necessary for preventing further spread of AIDS. Second—and more to the point of the present research—levels of public knowledge have considerable consequences for the structuring of public policy health debates and the long-term social outcomes for the AIDS epidemic. Public support or opposition will undoubtedly help determine the eventual success or failure of various health policies. And some research has already found that beliefs in the casual transmission of HIV are indeed predictive of increased levels of public support for certain restrictive and even discriminatory policies aimed at infected persons (Sniderman et al. 1987). Given that public health officials currently desire policies that are not heavily restrictive of HIV-infected persons (e.g., the President's Commission on the Human Immunodeficiency Virus Epidemic [Watkins 1988]) such findings certainly deserve attention.

Correct information—or misinformation—about the ways in which AIDS is contracted is certainly not the only factor underlying public opinion on AIDS-related issues. Long-standing public attitudes, in particular, attitudes toward the clearly defined social groups that have so far been most affected by AIDS, will also presumably play a large role. Some evidence bearing on this issue has also been uncovered: recent work has suggested that antihomosexual or homophobic attitudes may directly affect public policy preferences (Ostrow and Traugott 1988; Sniderman et al. 1987) and perhaps interfere with receptivity to publicized information about AIDS transmission (Stipp and Kerr 1989).

Previous research, then, although limited, has identified at least two variables that appear to be important predictors of public opinion concerning AIDS-related health policies: levels of misinformation about the transmissibility of AIDS and levels of antigay sentiment. But if these variables are to be dealt with effectively in the formulation of public health policy, and in the planning and implementation of health information campaigns, a better understanding of their origins is needed. What factors, in other words, contribute to AIDS knowledge and to antigay attitudes?

It seems reasonable to postulate that exposure to mass media messages about AIDS is the principal determinant of levels of AIDS knowledge, since the mass media have, to date, been the principal conduits for public information about the disease. The American public, at least, seems to credit the mass media as being a principal source of AIDS information (Singer, Rogers, and Corcoran 1987). Exposure to media messages is not, however, in and of itself sufficient to produce changes in knowledge—and certainly not changes in attitude or opinion. Decades of research on communication and attitude change have demonstrated that media audiences may, due to a variety of psychological factors, selectively attend to messages, distort or alter their meaning, and thus "resist" them (see, e.g., McGuire 1981). Recently Stipp and Kerr (1989) have argued that negative attitudes toward homosexuals can interfere with the acceptance of information from the mass media about AIDS.

Against this backdrop of limited prior research and findings, then, we propose the following set of propositions concerning the determinants of public opinion on AIDS-related policies:

1. The misunderstanding that AIDS can be easily contracted through casual contact with HIV-infected persons is a primary contributor to higher levels of support for more restrictive public policies aimed at people with AIDS.

2. Principal factors contributing to misunderstanding about AIDS transmission include (*a*) limited exposure to mass media messages about AIDS, (*b*) restricted ability to comprehend information that is received, and (*c*) attitudinal resistance to mass media messages due to various long-standing values and predispositions.

3. Consequently, variables that affect exposure and comprehension (e.g., socioeconomic background, age, education) or that may engender resistance to AIDS information (namely, elevated feelings of threat or fear, religious and moral beliefs, and attitudes toward sexual behavior) are thus expected to be principal predictors of misunderstanding.

4. Principal predictors of support for restrictive public policies toward people with AIDS are expected to include—in addition to misun-

derstanding about casual transmission—general attitudes toward individual freedoms and civil rights and political liberalism/conservatism and negative attitudes toward affected groups (e.g., toward homosexuals).

These four propositions are necessarily general, given the somewhat underdeveloped state of research in this area. Although the research literature on public opinion concerning AIDS is steadily expanding, it remains in relatively short supply. Furthermore, studies to date suffer from several important limitations. First, much of the research drawn from nationally representative surveys has been confined to aggregate-level data analysis, most of it descriptive or limited to bivariate cross-tabulations (e.g., Blake and Arkin 1988; Singer, Rogers, and Corcoran 1987). More recent efforts to extend this important work by pursuing multivariate analyses (e.g., Singer 1989) have still relied primarily upon demographic analyses. Meanwhile, more in-depth studies of determinants of knowledge, attitudes, or opinions using multivariate techniques at the individual level of analysis have generally been confined to regional rather than national surveys (e.g., Ostrow and Traugott 1988; Sniderman et al. 1987) or have investigated only a very small subset of variables (e.g., Stipp and Kerr 1989).

Unfortunately, then, we still lack a systematic understanding of even the most basic demographic and attitudinal determinants of public levels of knowledge about AIDS, or the ways in which AIDS knowledge and longer-standing attitudinal and social-structural variables operate together in shaping public opinions on potential AIDS policies. The present research aims at addressing these problems, by taking advantage of two extant survey data sets to pursue systematic, individual-level analyses of these issues. In line with the propositions outlined above, we propose and test a theoretical model of the relationships between a variety of social-structural background variables, knowledge of HIV transmission, attitudes toward homosexuals, and support for restrictive policies aimed at HIV-infected persons.

Method

Data used in the present study were taken from two *Los Angeles Times* polls, conducted in December 1985 and July 1987, which focused on AIDS. Both surveys involved telephone interviews with national samples of men and women age 18 and older (N = 2,308 in 1985; N = 2,095 in 1987). Responses were weighted to take account of household size, times at home, and variations in the sample relating to geographic region, age, gender, employment, race, and education. Telephone

numbers for the samples were generated by computer randomly within strata to insure that both listed and unlisted households were included.[1] Five standard metropolitan statistical areas (SMSAs), which together account for nearly half of the AIDS cases in the United States, were oversampled (Los Angeles, San Francisco, New York, Miami, and Newark, NJ). Data from the national sample and the oversampled SMSAs were weighted in the analyses according to the probability of selection.

MEASURES

Knowledge of AIDS transmission. The present study focuses on misinformation about the transmissibility of AIDS rather than correct information about ways in which AIDS can be contracted. By 1985, when the first of the two *Los Angeles Times* polls was conducted, well over 90 percent of the general population already understood that AIDS could be transmitted through intimate sexual contact, the sharing of hypodermic needles, and blood transfusions. But the incorrect impression that AIDS can also be transmitted through a variety of far more casual forms of contact with infected persons clearly persisted.

Four questions included in the 1985 survey were used to assess respondents' levels of misinformation concerning AIDS transmission: people were asked whether they thought someone could contract AIDS in four different ways: (1) from eating food that had been handled by a person with AIDS (19 percent replied "yes"); (2) from a toilet seat (24 percent "yes"); (3) from trying on clothes in a department store (14 percent "yes"); and (4) from handling money (10 percent "yes"). The four questions were recoded to take the values 0 = no, and 1 = yes or not sure. The exact wording of each question, including item means and standard deviations, are presented in table A1.

Only two of these questions were repeated on the 1987 survey (see table A2). In the 2 years intervening between the surveys, levels of misinformation about the transmissibility of AIDS declined only slightly. A sizable number of respondents still believed that AIDS could be contracted through food (14 percent indicated they thought so) or from a toilet seat (20 percent said "yes").

Attitudes toward homosexuals. Four questions included in the 1985 survey were used to measure attitudes toward homosexuals. These questions asked respondents (1) whether they thought that homosexuals have too little or too much political power (8 percent said "too

1. Response rates were 76 percent for the 1987 survey (*Los Angeles Times*, poll no. 126) and 65 percent for the 1985 survey (poll no. 101).

little," 39 percent said "about right," and 34 percent said "too much"); (2) whether their views about homosexuality were liberal or conservative (29 percent were "very" or "somewhat" liberal toward homosexuality, 44 percent were "very" or "somewhat" conservative); (3) to what degree they considered sexual relations between adults of the same sex to be wrong (73 percent felt that it was "always" or "almost always" wrong); and (4) what their personal attitude was toward homosexuality (50 percent were personally opposed to homosexual relations). Responses to all four questions were recoded such that 1 = the response most supportive of homosexuals and 5 = the least supportive response. Again, the exact wording of each question and descriptive statistics are provided in table A1.

Only two of these four questions were repeated in the 1987 survey, and responses to these questions were overall quite similar to the data from the earlier survey. When asked their overall views of homosexuality, 23 percent said they were "very" or "somewhat" liberal, while 42 percent said they were "very" or "somewhat" conservative. On the matter of gay political power, 13 percent of 1987 respondents felt that homosexuals had "too little" power, 32 percent said that gay political clout was "about right," and 34 percent indicated that homosexuals had "too much" political power. Once again the items were recoded to a 1–5 interval (see table A2).

Opinions concerning restriction of HIV-infected people. The 1985 survey also carried three questions that assessed the level of support for policies aimed at restricting people infected with AIDS as a means of combating the disease. These restrictions included: (1) requiring persons exposed to AIDS to carry identification (ID) cards (48 percent in favor, 43 percent opposed, 9 percent not sure); (2) quarantining AIDS patients (51 percent in favor, 40 percent opposed, 9 percent not sure); and even (3) tattooing people exposed to AIDS (15 percent in favor, 78 percent opposed, 6 percent not sure). The three items were coded with values 1 = opposed, 2 = not sure, and 3 = in favor (wording and descriptive statistics for each item can be found in table A1).

It is surprising that such a sizable minority within the general population—here estimated at about 15 percent—would support a measure as extreme as tattooing persons with AIDS. Yet support for such restrictions, as with the aforementioned persistence of AIDS misinformation and antigay sentiment, apparently remained constant or increased slightly from 1985 to 1987. The two restriction measures repeated in 1987 produced a pattern of response similar to that found 2 years earlier. On the matter of quarantining AIDS patients, 52 percent favored such a measure, while 41 percent opposed it and 7 percent

were unsure. Those in support of tattooing AIDS patients amounted to 29 percent of respondents, with 64 percent opposed and 6 percent unsure. These two questions were coded in the same manner as those from the 1985 survey (see table A2).

Antecedent variables. Although direct measures of exposure or attention to AIDS information in the mass media were not readily available, the 1985 survey did include four relevant background variables that were expected to be correlated with exposure to media messages about AIDS or with the ability to comprehend such messages, or that were thought to be potentially correlated with attitudinal resistance to AIDS information. Recent research on learning from the news (e.g., Price and Zaller 1990; Robinson and Levy 1986) has established that social-structural variables—and in particular, education—are in fact stronger predictors of news reception than are self-report measures of media exposure or attention to public affairs. Because research has found that older, better-educated, and upper-class respondents are more likely to receive public affairs information from the media (Robinson and Levy 1986), our analyses included three variables as predictors of information about AIDS: respondents' education (measured on a 9-point scale from "some grade school or less" to "graduate degree" and recoded to correspond to years; M = 12.34, S.D. = 2.82, N = 2,228); respondents' age (M = 42.80, S.D. = 17.46, N = 2,187); and household income (measured on a scale from 1 = under $10,000 to 7 = over $60,000; M = 3.43, S.D. = 1.66, N = 1,859).

Both education and age have been found in prior research to be predictive of antigay sentiments as well, such that older and less educated people tend to view homosexuals more negatively than others (e.g., Irwin and Thompson 1977; West 1977). There are also suggestions in the literature that political ideology is related to attitudes toward homosexuals (e.g., Bierly 1985; Rudolph 1989), with liberals and Democrats expressing more tolerant attitudes. For these reasons our analysis included three predictors of antigay attitudes: education, age, and political liberalism. The latter was assessed by the question: "How would you describe your views on most matters having to do with politics? Do you generally think of yourself as being very liberal, or somewhat liberal, or middle-of-the-road, or somewhat conservative, or very conservative—or don't you pay all that much attention to politics?" Responses were ordered along a continuum from 1 = very conservative to 5 = very liberal, with "don't pay attention" responses coded at the midpoint (M = 2.89, S.D. = .97, N = 1,954). All of the same background measures were also included in the 1987 survey. Item statistics for each were again quite similar to those from the earlier poll (years of education: M = 12.52, S.D. = 2.66, N = 2,077;

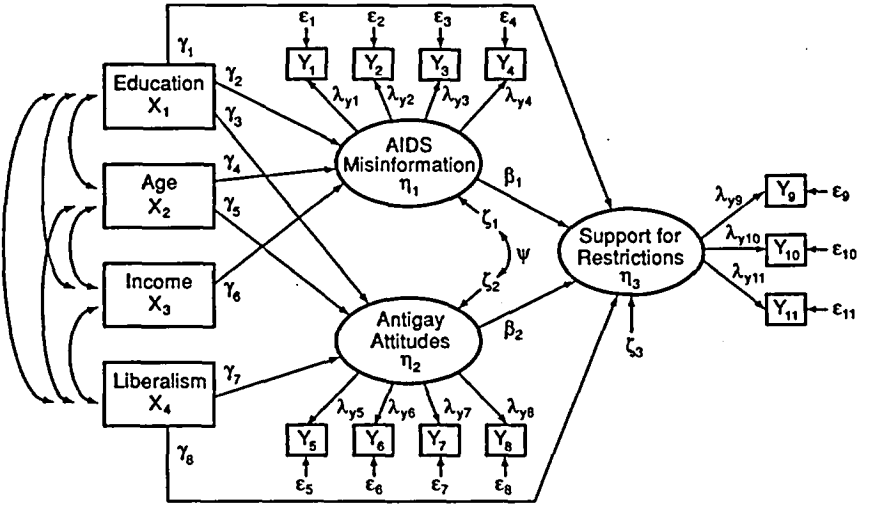

Figure 1. Theoretical model

age: M = 43.18, S.D. = 17.98, N = 2,062; income: M = 3.77, S.D. = 1.87, N = 1,969; and political liberalism: M = 2.852, S.D. = .91, N = 2,027).

THEORETICAL MODEL TO BE TESTED

Because multiple measures were available for several of the constructs of interest—AIDS misinformation, antigay attitudes, and support for restricting people with AIDS—the hypothesized theoretical relationships linking each of the above measures were examined using latent variable structural equation methods. The set of postulated relationships, derived from the general expectations outlined above, is depicted in figure 1. In the figure, each survey question (or "observed" variable) is depicted as a rectangle, while "latent" constructs (or "unobserved" variables) are depicted as ovals. As illustrated, each of the four background variables—education (X_1), age (X_2), income (X_3), and political liberalism (X_4)—are exogenous to the model. The three endogenous variables (all of which are latent constructs) include two that are intervening—AIDS misinformation (η_1) and antigay attitudes (η_2)—while support for restrictions (η_3) is the dependent variable.

We rely upon single measures for each of the four exogenous variables (X_1 through X_4). However, as described earlier, we have multiple survey questions to assess each of the intervening variables and the dependent variable. Thus AIDS misinformation (η_1) is modeled as a

latent construct indicated by four observed variables: questions about whether AIDS can be transmitted by toilet seats (Y_1), handling food (Y_2), trying on clothes (Y_3), or by handling money (Y_4). Similarly, antigay attitudes variable (η_2) is modeled as a latent construct indicated by four attitude questions: whether gays have too much power (Y_5), how conservative toward gays the respondent feels (Y_6), whether gay sex is thought to be wrong (Y_7), and the respondent's overall reported negativity toward gays (Y_8). Finally, support for restrictions (η_3) has three indicators: whether the respondent favors an AIDS quarantine (Y_9), tattoos for HIV-infected people (Y_{10}), or identification cards (Y_{11}). Thus the model illustrated in figure 1 includes a set of factor-analytic equations linking each of the observed Y variables (the survey questions described above) to their respective latent constructs. The λ_Y parameters shown refer to the factor loadings for each observed variable on its latent construct, and the ϵ parameters refer to the residual variances, or errors in measurement, for the observed indicators. The inclusion of this factor-analytic model allows us to estimate structural path coefficients for relationships among the latent constructs themselves, that is, estimates for path coefficients that are disattenuated for unreliability in the individual measures.

The parameters γ_2, γ_4, and γ_6 in figure 1 assess the hypothesized structural paths from education, age, and income, respectively, to AIDS misinformation, while γ_3, γ_5, and γ_7 assess the hypothesized paths from education, age, and liberalism to antigay attitudes. In turn, AIDS misinformation and antigay attitudes are expected to influence support for restricting AIDS patients, as depicted in figure 1 by parameters β_1 and β_2. The model thus hypothesizes two general "routes" leading to support for restricting people with AIDS: a cognitive path operating through knowledge of HIV transmission and an attitudinal route flowing, as it were, through antigay sentiment. Due to the likelihood that not all of the influence of education and political liberalism on support for restrictions operates indirectly via misinformation and antigay attitudes, the model also includes direct paths to support for restrictions from each of these variables (parameters γ_1 and γ_8).

The ζ parameters refer to the residual variances, or errors in prediction, for each of the three endogenous η constructs. As indicated, the residual variance in AIDS misinformation (ζ_1) and the residual variance in antigay attitudes (ζ_2) are expected to be correlated due to the likelihood that they share several mutual causes not included in our model. This correlation (ψ), we expect, will be positive.

The same theoretical model illustrated in figure 1 was tested using both the 1985 and 1987 survey data. In the calculating model estimates for 1987, however, only two measures were available for use as indicators of each endogenous latent variable (see questions in table A2).

1985 Survey Results

The model illustrated in figure 1 was estimated using LISREL 7, a computer program that estimates the parameters in structural equation models (Jöreskog and Sörbom 1989). The LISREL program generates these estimates by minimizing the difference between sample covariances (i.e., the inter-item covariances, calculated from the sample, among the full set of observed variables described above) and the covariances that are predicted by the hypothesized model. Because most of the variables under study here are ordinal measures, a matrix of inter-item polychoric and polyserial correlations rather than Pearson correlations or covariances was used in the analysis, and a weighted least-squares (WLS) method of estimation was employed.[2] Computation of the correlation matrix was carried out using a listwise deletion of missing cases, resulting in 1,706 valid observations.[3]

GOODNESS OF FIT

Before discussing the obtained weighted least-squares estimates for the model parameters, we should first consider the overall fit of the model to the data. Several summary measures, which assess in various ways the fit between the inter-item correlations observed in the sample and those predicted by the model, are presented in table 1. The obtained χ^2 statistic for the model (here used as a "badness-of-fit" rather than a goodness-of-fit measure) is clearly significant ($p < .01$). Nevertheless, other considerations suggest that the model fits the data reasonably well. Previous results with structural equation modeling have indicated that the χ^2 statistic can be large and significant even with good fits, particularly when the covariance matrix under analysis is based upon a very large number of observations (Carmines and McIver 1981; Hayduk 1987; Jöreskog and Sörbom 1989). Table 1 thus provides the goodness-of-fit index (GFI = .99), which theoretically ranges from 0 to 1 and indicates the relative amount of variance and covariance explained by a model. A modified version of this index (AGFI = .98) adjusts the goodness-of-fit measure by taking into account the degrees of freedom in the model. A third approach to determining goodness of

2. In computing the matrix, all variables were treated as ordinal except age, which is continuous.

3. Listwise deletion of missing values produces a correlation matrix with several desirable properties (Bollen 1989), but it does in this instance eliminate a substantial number of cases. Thus, for comparative purposes, matrices computed using pairwise deletion and mean substitution were also analyzed. Parameter estimates and measures of fit were very nearly identical across the three sets of results.

Table 1. Overall Goodness-of-Fit Estimates (1985 Survey)

Summary Measures	Values
χ^2 (with 77 *df*)	393.24
Probability (p)	$< .01$
Goodness-of-fit index (GFI)	.99
Adjusted goodness-of-fit index (AGFI)	.98
Bentler and Bonett (Δ_1)	.97
Bollen (Δ_2)	.97
Bollen (ρ_1)	.96
Tucker and Lewis (ρ_2)	.97
Root mean square residual (RMSR)	.06
Coefficient of determination for Y variables (CD_Y)	.99
Total coefficient of determination for structural equations (TCD)	.49

SOURCES.—GFI and AGFI are proposed as goodness-of-fit measures by Jöreskog and Sörbom (1989). Other goodness-of-fit measures are taken from Bentler and Bonett (1980), Bollen (1989), and Tucker and Lewis (1973).

Table 2. Standardized WLS Estimates for Measurement Components (1985 Survey)

Latent Constructs/Observed Measures	Factor Loading (λ_Y)	Measurement Error (ϵ)
η_1, misinformation about transmission:		
Y_1 transmission: toilet	(.80)	.36*
Y_2 transmission: food	.94*	.12*
Y_3 transmission: clothes	.63*	.61*
Y_4 transmission: money	.90*	.18*
η_2, negative attitudes toward gays:		
Y_5 gays: too much power	(.62)	.62*
Y_6 gays: conservative toward	.76*	.43*
Y_7 gays: gay sex is wrong	.88*	.22*
Y_8 gays: negative toward	.79*	.38*
η_3, support for restricting people with AIDS:		
Y_9 restrictions: quarantine	(.71)	.50*
Y_{10} restrictions: tattoo	.64*	.59*
Y_{11} restrictions: ID cards	.74*	.45*

NOTE.—Factor loadings in parentheses were fixed at a value of 1.00 prior to standardizing to establish the unit of measurement for each latent construct.
* $p < .01$.

fit is to contrast the model's χ^2 value to that obtained by a general null or baseline "no-factor" model. The Δ and ρ measures listed in table 1 are of this variety. Bentler and Bonett (1980) and Bollen (1989) suggest that models producing values of such "incremental fit" indices below .90 can usually be improved substantially. As illustrated by table 1, the obtained indices are all well above this value. A fourth rough indicator of model fit is the root mean square residual (RMSR = .06), which represents the average deviation between the observed sample correlations and those predicted by the postulated model. Two final summary measures are also presented. The coefficient of determination for the Y variables (CD_Y = .99) indicates how well the Y variables serve as joint indicators of the η constructs, while the total coefficient of determination (TCD = .49) assesses how well the structural equations account for the η constructs.

Taken together, then, these results suggest that the model fits the data reasonably well. Estimates for the measurement model, including factor loadings and error variances for the indicators of each latent construct, can be found in table 2. As shown, the loadings for all indicators on their respective latent constructs are substantial.

STRUCTURAL PATH ESTIMATES

Standardized weighted least-squares estimates of the structural parameters of the model are displayed in figure 2. The residual variances for each of the endogenous η constructs (i.e., the percentages of variance in these constructs left "unexplained" by the structural equations) indicate that the model does succeed in accounting for sizable proportions of variance. The estimated model explains 13 percent of the variance in AIDS misinformation, 33 percent of the variance in antigay attitudes, and half (51 percent) of the variance in support for restricting persons with AIDS. As expected, the residual variances in AIDS misinformation and in antigay attitudes are positively correlated (ψ = .28), suggesting that they do share mutual causes not included in the model.

Most worthy of note are the substantial and significant coefficients for the structural paths from AIDS misinformation and antigay attitudes to support for restrictions (β_1 = .36, β_2 = .32). Just as striking is the estimated influence of education, which is linked to lower levels of support for restrictions not only through strong intermediate effects on levels of AIDS misinformation (γ_2 = −.27) and antigay sentiment (γ_3 = −.25), but also through a direct structural path (γ_1 = −.29) as well. The estimated total effects of education on support for restrictions are thus rather large ($\gamma_1 + \gamma_2\beta_1 + \gamma_3\beta_2$ = −.46). The negative relationship between political liberalism and support for restrictions, on the other hand, appears to be mediated almost exclusively via inter-

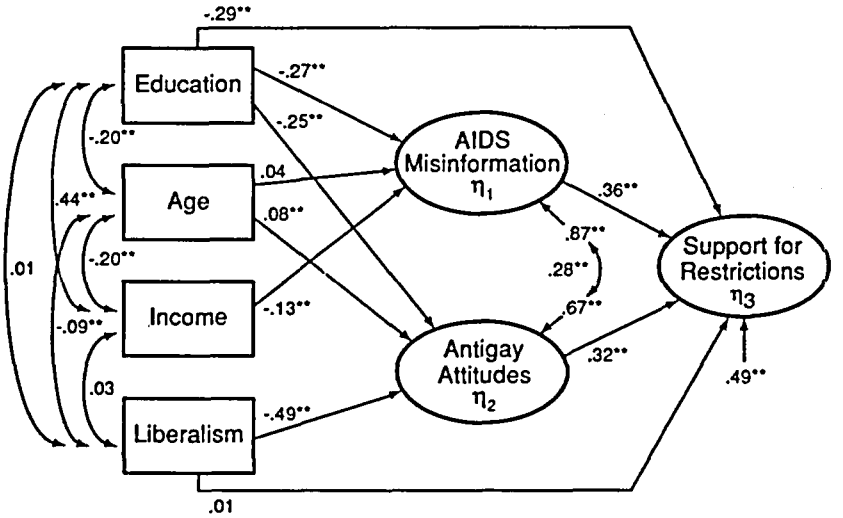

Figure 2. Standardized WLS estimates for structural equations (1985 survey); $^{**}p < .01$.

mediate influence on antigay sentiment ($\gamma_7 = -.49$). The expected negative direct path from liberalism to support for restricting AIDS patients is not obtained, and consequently the estimated total effects of liberalism are smaller ($\gamma_8 + \gamma_7\beta_2 = -.15$).

Finally, estimates of the parameters for the structural paths from age to AIDS misinformation and antigay attitudes—as with the coefficient for the path linking income to AIDS misinformation—are in the expected directions, although they are each modest or small in size.

1987 Survey Results

The same theoretical model was also tested using data from the 1987 survey, based upon a matrix of polychoric and polyserial correlations for the subset of variables available (as described for the 1985 results above). Computation of the matrix was again carried out using a listwise deletion of missing cases, resulting in 1,830 valid observations.

GOODNESS OF FIT

Indices of overall fit for the model, which are shown in table 3, once again indicate that the model fits the data rather well. In fact the fit is actually somewhat better than was the case for the 1985 data. Although the obtained χ^2 statistic is again clearly significant, the goodness-of-fit

Table 3. Overall Goodness-of-Fit Estimates (1987 Survey)

Summary Measures	Values
χ^2 (with 22 *df*)	73.09
Probability (*p*)	< .01
Goodness-of-fit index (GFI)	.99
Adjusted goodness-of-fit index (AGFI)	.99
Bentler and Bonett (Δ_1)	.98
Bollen (Δ_2)	.99
Bollen (ρ_1)	.96
Tucker and Lewis (ρ_2)	.97
Root mean square residual (RMSR)	.04
Coefficient of determination for *Y* variables (CD_Y)	.98
Total coefficient of determination for structural equations (TCD)	.44

SOURCES.—GFI and AGFI are proposed as goodness-of-fit measures by Jöreskog and Sörbom (1989). Other goodness-of-fit measures are taken from Bentler and Bonett (1980), Bollen (1989), and Tucker and Lewis (1973).

indices are all quite high (close to 1.0), and the root mean square residual is small (.04). Estimates for the measurement model, including factor loadings and error variances for the indicators of each latent construct, can be found in table 4. As was true for the 1985 data, the loadings for each indicator are again substantial.

STRUCTURAL PATH ESTIMATES

Standardized weighted least-squares estimates of the model parameters are displayed in figure 3. As indicated by the estimated residuals of the structural equations, the model accounts for proportions of variance in the three η constructs that are comparable to the proportions explained in the 1985 results: 19 percent of the variance in AIDS misinformation, 31 percent of the variance in antigay attitudes, and 48 percent of the variance in support for restricting persons with AIDS. As expected, the residual variances in AIDS misinformation and in antigay attitudes are again positively correlated ($\psi = .31$).

Indeed, what is most striking about the estimates presented in figure 3 is the degree to which they replicate the results from the initial 1985 analysis. Again we find large and significant coefficients for the structural paths from AIDS misinformation and antigay attitudes to support for restrictions ($\beta_1 = .42$, $\beta_2 = .34$). Education is again linked negatively to support for restrictions via strong indirect negative effects on levels of AIDS misinformation ($\gamma_2 = -.37$) and antigay senti-

Table 4. Standardized WLS Estimates for Measurement Components (1987 Survey)

Latent Constructs/Observed Measures	Factor Loading (λ_Y)	Measurement Error (ϵ)
η_1, misinformation about AIDS transmission:		
Y_1 transmission: toilet	(.91)	.17*
Y_2 transmission: food	.75*	.44*
η_2, negative attitudes toward homosexuals:		
Y_5 gays: too much power	(.57)	.68*
Y_6 gays: conservative toward	.79*	.38*
η_3, support for restricting people with AIDS:		
Y_9 restrictions: quarantine	(.76)	.42*
Y_{10} restrictions: tattoo	.59*	.66*

NOTE.—Factor loadings in parentheses were fixed at a value of 1.00 prior to standardizing to establish the unit of measurement for each latent construct.
* $p < .01$.

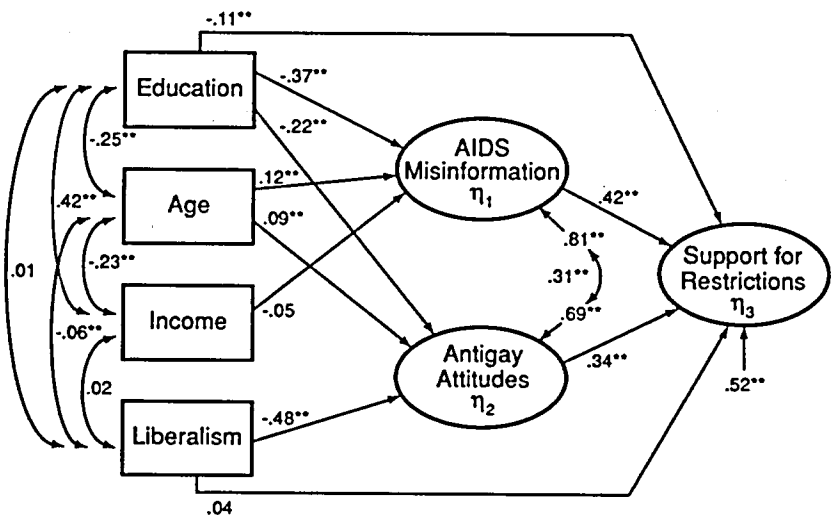

Figure 3. Standardized WLS estimates for structural equations (1987 survey); **$p < .01$.

ment ($\gamma_3 = -.22$).[4] A strong negative relationship between political liberalism and support for restrictions is again operative via an intermediate impact on antigay sentiment ($\gamma_7 = -.48$).[5]

One point of divergence between findings from 1987 and 1985, however, lies in the conflicting estimates for the parameter assessing the direct structural path from education to support for restricting AIDS patients. While both estimates are negative and significant, the coefficient calculated from the 1987 data is less than half as large as that previously obtained ($\gamma_1 = -.11$, compared with $-.29$ in 1985). In fact, additional analyses of the 1987 data indicated that an alternative structural model without any direct paths from education or liberalism to support for restrictions—in other words, a model that forces all the impact of the background variables on policy opinions to operate indirectly via intermediate effects on AIDS misinformation and antigay attitudes—would fit the data just as well. Such was not the case with the 1985 results, however, which indicated that the model including direct paths (as presented) fit the data significantly better.[6]

4. The research findings of Sniderman et al. (1987) suggest that education may interact with other variables (particularly antigay attitudes) in affecting opinion on AIDS-related issues, thereby producing different path models for high- and low-education respondents. To test this possibility, we conducted group comparisons employing covariance matrices calculated separately for respondents with a high school education or less (1985 survey, $N = 985$) and for those respondents with a higher education (1985 survey, $N = 721$). Using maximum likelihood (ML) methods, we first estimated a baseline model that stipulated the same measurement and structural components across the two groups, but which allowed all parameters estimates to vary between groups (X^2 with 154 df = 661.07; $GFI_{LO} = .95$; $GFI_{HI} = .96$). We then estimated a second, more restrictive model constraining all structural parameters (i.e., all γ and β coefficients) to be equal across the high and low education groups. The second model fit the data just as well (X^2 with 164 df = 671.11; $GFI_{LO} = .95$; $GFI_{HI} = .96$), and the difference χ^2—an omnibus test for the equality of the structural path coefficients across the two groups—was not significant (ΔX^2 with 10 df = 10.04, $p < .30$). Results from these stratified models, then, do not support the hypothesis that substantially different path models are obtained from high- and low-education respondents.

5. Because the model estimates at the two time periods were generally so similar, we conducted group comparisons to test the equivalency of structural path coefficients across two time periods. Using covariance matrices and ML methods, we estimated a baseline model stipulating the same measurement and structural components across the two groups but allowing parameters estimates to vary between groups (X^2 with 44 df = 279.13; $GFI_{85} = .98$; $GFI_{87} = .99$). A second, more restrictive model constraining all structural parameters (i.e., all γ and β coefficients) to be equal across the earlier and later surveys fit the data very nearly as well (X^2 with 54 df = 317.55; $GFI_{85} = .98$; $GFI_{87} = .99$). However, an omnibus test for the equality of the structural path coefficients across the two time periods indicated that at least some of the structural path coefficients differed significantly (ΔX^2 with 10 df = 38.42, $p < .01$). An inspection of LISREL modification indices and subsequent model evaluations suggested that differences in the coefficients for the paths between education and support for restrictions (γ_1) and between age and AIDS misinformation (γ_3) were primarily responsible for rejection of the omnibus equivalency hypothesis.

6. It may indeed be that the phenomena being studied changed over time (see n. 5

Discussion

The research reported here provides convincing evidence that misinformation about AIDS transmission and negative attitudes toward homosexuals are strong predictors of support for stringent restrictions of HIV-infected persons. The basic theoretical model that was tested proved an adequate fit to the data for both national surveys investigated, and accounted for a very substantial proportion of variance in support for restricting people with AIDS. There are, however, several important considerations to keep in mind while interpreting the present findings.

CAUSAL INFERENCES AND STRUCTURAL MODELS

First, we should not assume that particular causal relationships have been demonstrated because a given path model fits observational data well. As Bollen (1989) argues, causation cannot be proven with any statistical procedure. The purpose of structural modeling is instead to determine if a set of theoretical relationships, which may be causal in nature, is consistent with the data. In the present case, our results suggest that the proposed model is tenable. But other models, with different assumptions, may also fit the data well.

Furthermore, the magnitude and significance, even the direction, of parameters estimates from structural equation models can vary depending upon model specifications. In this fundamental respect, latent variable structural equation modeling is no different from other, more standard statistical techniques such as ordinary least-squares regression: alternative model specifications can affect one's results. We have provided here, we believe, a theoretically and empirically plausible model of the factors underlying support for restrictive AIDS policies. But we are clearly limited in this analysis by the measures available in our data set; including different variables might have produced different findings.

TESTING ALTERNATIVE MODELS

Although we can only speculate about the ways in which absent variables might affect our results, we can nonetheless assess the degree to which our findings would change if the postulated relationships among the current set of variables were altered (i.e., if the model were

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above). It seems well worth noting, at any rate, that parameter estimates generated by the alternative model for 1987, which included no direct paths from education or liberalism to support for restrictions, deviated only slightly from those presented here.

respecified in different ways). In an effort to gauge the robustness of our results, then, we estimated several alternative models using WLS methods. These supplementary analyses indicated that the parameter estimates for our model were generally quite robust, even though other good-fitting models were possible.

One reasonable comparison model, for example, might include all possible γ paths (i.e., structural paths linking every exogenous X variable to every endogenous η construct). The overall fit indices for this "all paths" model were in fact better than those obtained for the more parsimonious model presented in figures 1–3 (for 1985, X^2 with 73 df = 280.22, GFI = .99, AGFI = .98; for 1987, X^2 with 18 df = 43.38, GFI = .99, AGFI = .99). However, the coefficients for the paths estimated from our original model deviated only slightly from those estimated in this alternative model (although some were, as might be expected, slightly attenuated). Moreover, few of the additional path coefficients in this comparison model were sizable or significant. The notable exceptions were two: estimates for the direct path from age to support for restrictions were statistically significant in both surveys (the standardized path coefficient was −.09 in 1985 and −.12 in 1987), as were those for the path from liberalism to AIDS misinformation (the standardized coefficient was −.20 in 1985 and −.10 in 1987). The latter paths, indicating that liberals were better informed than conservatives even after controlling for age, income, and education, was not originally anticipated. However, it is generally consistent with the view of Stipp and Kerr (1989), who suggest that background attitudes may play a role not only in the formation of policy opinions, but also in the reception of AIDS information.

There may also be some direct causal connections between attitudes toward homosexuals and misinformation about AIDS that are not incorporated into the model proposed and tested here. Stipp and Kerr (1989) suggest that antigay attitudes actually cause exaggerated beliefs about the easy transmission of AIDS and prevent accurate information from being accepted.[7] It also seems plausible to think of the direction of causality running in the opposite direction (from misinformation to

7. Stipp and Kerr (1989) cite an interaction between antigay attitudes and education in the prediction of AIDS misinformation. They find that education is a strong predictor of AIDS misinformation, but only for those members of the public who are not antigay. Their data, however, are problematic in that the measure of AIDS misinformation employed was based on questions that dealt with actions that might be taken toward HIV-infected persons and that were, the authors admit, "originally phrased as an attitude item but which seemed to be suitable as a substitute measure of beliefs about AIDS transmission" (p. 99). Our data, like those reported by Stipp and Kerr, evidence a strong relationship between antihomosexual attitudes and AIDS misinformation. But when we attempted to replicate their findings using OLS regression (as they had), we found no interaction between antigay attitudes and education in the prediction of beliefs about AIDS—nor, in fact, in the prediction of support for restricting people with AIDS.

antigay attitudes), to entertain notions of mutual causation, or to posit that these variables are both to some extent functions of other variables (such as a heightened sense of personal threat from AIDS). We did estimate alternative models including paths linking these constructs, but lack of data resources precluded rigorous testing of these various causal hypotheses.[8] These matters remain, then, fertile ground for additional research.

THE NATURE OF THE DEPENDENT MEASURES

Finally, it is important to bear in mind the fact that our primary dependent variable—support for restricting persons with AIDS—was assessed via a set of questions that dealt with some rather severe policies (e.g., issuing ID cards and tattooing HIV-infected people). Thus we would naturally expect stronger associations between levels of support for these kinds of potential actions and negative attitudes toward homosexuals than we would expect, say, between support for government spending or for certain kinds of testing policies and antigay attitudes. Findings from at least one major regional survey, however, have suggested that attitudes toward homosexuals play a key role in predicting opinions in these other domains of public health policy as well (Ostrow and Traugott 1988).

SOME IMPLICATIONS

Despite these limitations, there are several important implications of the findings that deserve highlighting. First, it is well worth noting that AIDS misinformation and negative attitudes toward homosexuals, while they are clearly correlated, appear to function as independent

8. While it *is* possible to estimate models from our data with paths linking AIDS misinformation and antigay attitudes, interpretation of the findings becomes clouded due to the absence of any strong theoretical imperatives and the fact that there are many equivalent models fitting the data equally well. Equivalent models have the same number of parameters, the same fitted residuals, and the same measures of overall model fit (Steltz 1986). For example, one could alter the model in fig. 1 by adding a path from antigay attitudes to AIDS misinformation. Alternatively, one could add a path from liberalism to AIDS misinformation. The models are substantively rather different, but they involve the same number of parameters and fit the data identically. Despite these ambiguities, we did estimate various models with paths linking AIDS misinformation and antigay attitudes. Such models produced significant and positive coefficients for paths in both directions, with coefficients for the path from AIDS misinformation to antigay attitudes being somewhat larger (around .25 in each survey) than those for the path running in the opposite direction (around .15 in each survey). Overall measures of fit for such models were very similar to those obtained for the models presented in figs. 2 and 3. We hesitate, on the basis of these results, to draw any conclusions about likely causal connections between these two constructs. They are clearly related, but the precise nature of this relationship is unclear.

predictors of policy preferences. This finding is important because it suggests that efforts to build consensus for AIDS-related policies should be concerned both with potential cognitive obstacles (i.e., a lack of proper public understanding) and with attitudinal obstacles (i.e., a lack of positive sentiment toward subpopulations affected most by AIDS).

Second, education emerges as an unquestionably important predictor of levels of support for restricting people with AIDS. Respondents' education was linked strongly with both of the key intervening cognitive and attitudinal factors examined here. Not only that, but the findings suggest that education may even explain a reasonable amount of variance in support for restrictive policies independent of that mediated by AIDS misinformation or by negative attitudes toward homosexuals. Precisely why this is so is a question deserving of further analysis. At any rate, the fact that those most likely to support severe restrictions of HIV-infected people are lowest in educational attainment (and thus perhaps those most difficult to "win over" in health campaigns or in efforts to build consensus for public health policy) is also well worth noting.

Above all, the analyses reported here testify to the utility of carefully examining the underpinnings of the public's understanding of the AIDS crisis. Perhaps the accumulation of findings such as these, many of them generated from the analysis of extant survey data, will eventually provide health care policy planners, professional mass communicators, and designers of behavioral and attitudinal interventions with the information they need to succeed in the fight against AIDS.

Appendix

Table A1. Question Wordings, Means, and Standard Deviations (1985 Survey)

Question Wording	Mean	S.D.	*N*
η_1, misinformation about AIDS transmission:			
Y_1 "In your opinion, can someone catch AIDS from a toilet seat?" (0 = no; 1 = yes, not sure)	.368	482	2,308
Y_2 "In your opinion, can people catch AIDS from eating food which has been handled by someone who has AIDS?" (0 = no; 1 = yes, not sure)	.345	.475	2,298
Y_3 "In your opinion, can someone catch AIDS from trying on clothes in a department store?" (0 = no; 1 = yes, not sure)	.244	.430	2,304
Y_4 "In your opinion, can someone catch AIDS from handling money?" (0 = no; 1 = yes, not sure)	.207	.405	2,301
η_2, negative attitudes toward homosexuals:			
Y_5 "How do you feel about the political activity of homosexuals—that is, both gays and lesbians? Do you think that homosexuals have too little political power, or about the right amount, or do you think that homosexuals have too much political power?" (1 = too little; 3 = about the right amount, not sure; 5 = too much)	3.521	1.182	2,281
Y_6 "How would you describe your views about homosexuality? Do you generally think of yourself as very liberal, somewhat liberal, middle-of-the-road, somewhat conservative, or very conservative about homosexuality?" (1 = very liberal; 2 = somewhat liberal; 3 = middle-of-the-road, not sure; 4 = somewhat conservative; 5 = very conservative)	3.341	1.391	2,269

Table A1 (*Continued*)

Question Wording	Mean	S.D.	*N*
Y_7 "What about sexual relations between two adults of the same sex? Do you think it is always wrong, or almost always wrong, or wrong only sometimes, or not at all wrong?" (1 = not at all wrong; 2 = not sure; 3 = wrong only sometimes; 4 = almost always wrong; 5 = always wrong)	4.063	1.510	2,288
Y_8 "What is your attitude toward homosexuality? Do you personally approve of homosexual relations between consenting adults . . . or do you think it's alright for other people but not for yourself . . . or do you oppose it for everyone?" (1 = approve; 3 = ok for others, not sure; 5 = oppose)	2.031	.855	2,285
η_3, support for restricting people with AIDS—"Which of the following measures would you favor in order to control the spread of AIDS?":			
Y_9 "Would you favor or oppose adding AIDS to the list of diseases that must be quarantined?" (1 = oppose; 2 = not sure; 3 = favor)	2.112	.946	2,297
Y_{10} "Would you favor or oppose a tattoo for persons who test positive to the AID virus?" (1 = oppose; 2 = not sure; 3 = favor)	1.356	.726	2,278
Y_{11} "Would you favor or oppose identification cards for people who test positive to the AIDS virus?" (1 = oppose; 2 = not sure; 3 = favor)	2.056	.952	2,301

Table A2. Question Wordings, Means, and Standard Deviations (1987 Survey)

Question Wording	Mean	S.D.	*N*
η_1, misinformation about AIDS transmission:			
Y_1 "In your opinion, can someone catch AIDS from a toilet seat?" (0 = no; 1 = yes, not sure)	.316	.465	2,089
Y_2 "In your opinion, can people catch AIDS from eating food which has been handled by someone who has AIDS?" (0 = no; 1 = yes, not sure)	.274	.466	2,088
η_2, negative attitudes toward homosexuals:			
Y_5 "How do you feel about the political activity of homosexuals—that is, both gays and lesbians? Do you think that homosexuals have too little political power, or about the right amount, or do you think that homosexuals have too much political power?"(1 = too little; 3 = about the right amount, not sure; 5 = too much)	3.436	1.312	2,058
Y_6 "How would you describe your views about homosexuality? Do you generally think of yourself as very liberal, somewhat liberal, middle-of-the-road, somewhat conservative, or very conservative about homosexuality?" (1 = very liberal; 2 = somewhat liberal; 3 = middle-of-the-road, not sure; 4 = somewhat conservative; 5 = very conservative)	3.595	1.373	2,052
η_3, support for restricting people with AIDS—"Which of the following measures would you favor in order to control the spread of AIDS?":			
Y_9 "Would you favor or oppose adding AIDS to the list of diseases that must be quarantined?" (1 = oppose; 2 = not sure; 3 = favor)	2.115	.958	2,085
Y_{10} "Would you favor or oppose a tattoo for persons who test positive for the AIDS virus?" (1 = oppose; 2 = not sure; 3 = favor)	1.646	.901	2,079

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