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COHORT CHANGES IN THE SOCIAL DISTRIBUTION OF TOLERANT SEXUAL ATTITUDES

Fred C. Pampel

University of Colorado Boulder

Abstract

Though many studies have described societal-wide changes in tolerance for sexual behaviors outside marriage, few have examined how the social distribution of tolerant attitudes has changed. A diffusion-of-innovations approach predicts nonlinear change in the distribution: high SES groups adopt the attitudes first, which produces a positive relationship, but diffusion to other SES groups subsequently weakens the association with SES. I test this argument using the General Social Survey from 1973 to 2014 to compare the SES determinants of attitudes toward premarital sex, extramarital sex, same-gender sex, and teenage sex across 86 cohorts born from around 1900 to 1985. Multilevel age, period, and cohort models support diffusion arguments concerning tolerance of premarital sex by demonstrating that the effects of indicators of SES first strengthen and then weaken across cohorts. Little support emerges for diffusion arguments concerning tolerance of extramarital sex and teenage sex, and preliminary but suggestive support emerges concerning tolerance of same-gender sex.

Introduction

A key component of recent changes in family life and the growing emphasis on personal autonomy is tolerance of diverse forms of sexual behavior. In the United States, acceptance of premarital sex increased markedly in the 1960s, especially among younger cohorts (DeLamater and MacCorquodale 1979; Smith 1994; Thornton and Camburn 1987). Acceptance of same-gender sex has increased more recently (Hicks and Lee 2006; Schafer and Shaw 2009; Twenge, Sherman, and Wells 2014) and has been accompanied by greater support for civil liberties for gays and lesbians (Kozloski 2010) as well as worldwide opposition to sodomy laws (Frank, Camp, and Boutcher 2010). In contrast, acceptance of extramarital sex and teenage sex, which involve issues of commitment and maturity, remains low (Smith 1994).

Public attitudes toward nonmarital sexual behavior have both practical and theoretical importance. In practical terms, these attitudes reflect tolerance and openness toward groups with alternative lifestyles. Sociologists dating back to Stouffer (1955) and Hyman and Wright (1979) have noted substantial shifts toward tolerance of controversial groups and lifestyles, and shifts relating to intimate relationships have become salient in recent decades.

More recently Twenge, Carter, and Campbell (2015) demonstrate consistent increases in tolerance of a variety of unconventional groups from 1972–2012. The public expression of values supportive of sexual activities outside of marriage represents movement toward tolerance and equality. The recent and striking increase in acceptance of gay and lesbian sex and the 2015 Supreme Court ruling on same-sex marriage, although sources of cultural and political conflict, reflect dramatic changes in attitudes as well as legal recognition.

In theoretical terms, changes in attitudes toward nonmarital sexual behavior relate to broader changes in the family—marriage, divorce, cohabitation, childbearing, and women's roles—that have occurred over past decades (Cherlin 2004; Thornton and Young-DeMarco 2001) and over the last century (Fischer and Hout 2006). Demographers package the wide-ranging changes under the broad term of the second demographic transition (Lesthaeghe 2010), which links declining fertility, greater variety in family forms, and new work and lifestyle opportunities for women outside of marriage and childbearing to underlying changes in the value attached to tolerance and personal autonomy (Inglehart 1989). Theorists view these changes as part of a process of de-traditionalization and individualization in modern societies (Beck 1992; Giddens 1992): With economic prosperity, lower fertility, and a more generous welfare state freeing people from externally imposed constraints, moral codes, and customs, people look less to preordained life trajectories and more to individual fulfillment in making family choices. Individualization of sexual lifestyles stands as a crucial component of the broader changes.

Despite the importance of the trends and their connection to larger patterns of social change highlighted by sociological theories, we know little about how the change occurs. Empirical studies have described period and cohort changes in sexual attitudes (Baunach 2012; Bolzendahl and Myers 2004; Brewer 2008; Keleher and Smith 2012; Loftus 2001; Schafer and Shaw 2009; Smith 1994), sometimes decomposing change into portions due to cohort replacement and intracohort shifts (Baunach 2011; Danigelis, Hardy, and Cutler 2007; Elias et al. 2013; Harding and Jencks 2003; Sherkat et al. 2011; Treas 2002). Although these studies relate the trends in sexual attitudes to broader social and economic changes, they do less to identify the underlying social mechanisms or how broad trends translate into the changing distribution of tolerance across social groups.

The literature has also well described the cross-sectional determinants of tolerant attitudes. Although the determinants differ to some degree for the various types of sexual behaviors, studies show that younger, single, more educated, less religious persons with higher income and better jobs tend to hold more liberal attitudes (Adamczyk and Pitt 2009; Kozloski 2010; Kenneavy 2012; Loftus 2001; Ohlander, Batalova, and Treas 2005; Scott 1998; Smith 1994, 2011; Turner et al. 2005). However, with some exceptions discussed subsequently, studies seldom show how these cross-sectional relationships are related to the changes in attitudes over time.

This study goes beyond the common studies of trends in sexual attitudes, on the one hand, and cross-sectional group differences in sexual attitudes, on the other hand, to combine the two approaches. Specifically, it addresses the following question: How has the social distribution of tolerant attitudes toward nonmarital sex changed across cohorts? The next

sections apply cohort and diffusion arguments to changes in the social distribution of sexual attitudes and then extend the arguments by considering differences in attitudes toward specific sexual behaviors. To test the arguments, the analyses use data from consecutive surveys in the United States on measures of moral acceptance of several nonmarital or non-normative sexual behaviors.¹

Cohort and Change in Attitudes

One component of an explanation of changes in the social distribution of sexual attitudes focuses on cohorts and generational change. The key idea is that sexual attitudes, like many other attitudes and values, are strongly influenced by cohort membership. The cohort approach to societal change follows from a long tradition (Ryder 1965) that recognizes the important influence on lifelong attitudes of the social and ideational context at the time of a cohort's youth. The normative views of sexuality during a cohort's youth continue to endure over the remaining life course (Davis 2004; Harding and Jencks 2003). For example, liberalization in traditional sexual mores during the 1920s (Scott 1998) and 1960s (Smith 1994) affected the lifelong attitudes of cohorts entering adolescence and young adulthood during those decades.

In addition to cohort change, attitudes may shift throughout the life course (Andersen and Fetner 2008a; Danigelis, Hardy, and Cutler 2007; Treas 2002), and period changes relating to highly publicized events, social movements, government policies, political leadership, and ideological fashion can affect all cohorts (Baunach 2011; Firebaugh 1997). The spread of permissive views on premarital sex in the 1960s and same-gender sex in the 1990s occurred too suddenly to result from cohort change alone. But cohort proves useful in examining long-term change by allowing comparisons dating back to the early twentieth century.

Cohort change may take a form that involves more than changes in the composition of populations. Over time, groups having more tolerant attitudes become a larger portion of the total and lead to more tolerant attitudes overall (Becker 2012; Davis 2001; Loftus 2001). However, this kind of change assumes that the *determinants* of sexual attitudes remain constant across all cohorts and therefore does not incorporate cohort changes in the social distribution of attitudes. An alternative approach posits that changes in attitudes vary by position within cohorts and thus differs from compositional approaches. The next section describes this form of cohort change as part of arguments focusing on diffusion.

Diffusion and the Social Distribution of Attitudes

Another component of an explanation of changes in the social distribution of sexual attitudes focuses on diffusion of innovations. A broad literature that describes general processes of diffusion of innovations (Rogers 2003) may be applied to attitude change (Fischer and Hout 2006; Pampel 2011a, 2011b). As background, diffusion has been defined as the influence of

¹One might use the same approach to study sexual behavior. As Smith (1994:88) demonstrates, "There is a great deal of consistency between sexual attitudes and sexual behavior." However, sexual attitudes have importance in their own right, as they reflect the prevalence of tolerance and openness in society and the treatment of groups with alternative lifestyles. Individuals obviously need not participate in premarital, extramarital, or same-gender sex to hold tolerant attitudes about these actions. I focus here on sexual attitudes.

some individuals' adoption of innovative ideas and behaviors on the likelihood of adoption by others (Montgomery and Casterline 1993). Less traditional groups living in cities and having higher education, status, and income tend to be the first to adopt innovations, as they have cognitive, financial, and network resources that lead to awareness of new ideas and motives to adopt them (Rogers 2003). Their early adoption then may influence subsequent adoption by others. Diffusion often first occurs horizontally among higher SES groups, but vertical diffusion commonly follows, as lower-ranking groups adopt the practices and ideas of more prestigious groups (Strang and Soule 1998). Diffusion of ideas can come from personal interaction and interests or the relative advantage of adoption (Rogers 2003:229), but other mechanisms are likely important. For diffusion across socioeconomic groups, classic theories of social inequality and cultural distinction posit processes of class emulation and social influence (Bourdieu 1994; Weber 1958). Indeed, acceptance of new ideas may become self-sustaining after adopters reach a critical mass (Rogers 2003:343).

When linked to arguments about cohort change, diffusion theory suggests not only that each cohort holds more tolerant values and attitudes than the last but also that the relationship between socioeconomic characteristics and attitudes changes. The historical environment experienced uniquely by each cohort affects both the level and the determinants of tolerant sexual attitudes. As diffusion proceeds from innovative groups in older cohorts that initially adopt new views to a wider set of groups in more recent cohorts that adopt them later, each subsequent cohort successively incorporates broader segments of the population (Pampel 2011a, 2011b). These changes translate into differences in the social distribution of new attitudes.

Divergence and Convergence in Attitudes

The early stages of diffusion mostly involve changes among innovators. Older cohorts came of age during periods of high fertility, low contraceptive availability, and strong links between sex and procreation. In this environment, tolerant attitudes toward unconventional sexual behavior represented a daring innovation of the type that is adopted by those who come from urban backgrounds, have high education, and enjoy material security (Fischer 1978). In a form of backlash, traditional attitudes among other groups may harden in response. Change thus widens the gap between innovators and others, creates divergence in views, and strengthens the effects of SES on tolerance (Fisher and Hout 2006).

At later stages of change, however, tolerant sexual attitudes diffuse vertically from high-status innovators to lower-status, less innovative, and more traditional groups, so that views tend to become less polarized and more tolerant (Pampel 2011a, 2011b). Younger cohorts came of age during periods of low fertility, high contraceptive use, and new sexual freedoms, and tolerant attitudes toward diverse sexual behaviors became more commonplace among all socioeconomic groups. Continued change thus narrows the gaps in views between social groups, creates convergence, and weakens the effects of background variables.

This pattern of both divergence and convergence may account for the mixed findings of previous studies. In support of divergence, Sherkat and colleagues (2011) find that religious and political factors have become more important determinants of support for same-sex marriage in the United States; Smith (2011) finds that differences across groups in attitudes

toward homosexuality have increased over time in high-income nations; Andersen and Fetner (2008b) find that economic development affects tolerance of homosexuality more among high status professionals and managers than among the working class; and Twenge, Sherman, and Wells (2015) find greater increases in sexual attitudes among college graduates than others. In support of convergence, Kozloski (2010) finds that the relationships of education and religiosity with approval of homosexuality have weakened over time; Treas (2002) finds declining effects of education over time on permissive sexual attitudes; and Bolzendahl and Myers (2004) find that polarization has decreased in attitudes toward sexual behavior (as well as toward family responsibilities of women and women's participation in the public sphere). By distinguishing between cohorts, the diffusion arguments are consistent with both groups of studies: Change may involve divergence at the early stages of diffusion and convergence at the later stages.

Variation by Type of Sexual Attitude

This general diffusion theory needs to be extended to differentiate among attitudes toward premarital, same-gender, extramarital, and teen sex. The varied tolerance for these behaviors relates to issues of consensuality and heterosexuality.

First, a key normative theme is autonomy and freedom of choice among consenting adults. Frank, Camp, and Boucher (2010:871) describe the ideal: "Consent emerged as the cardinal rule of sexual relations, and free self expression became paramount. Increasingly, legitimate sex came to include only those activities that preserved individual autonomy and sovereignty. Other activities were nonconsensual and condemned accordingly." In this sense, greater sexual tolerance stems from individualism and support for self-expression and personal autonomy as universal human rights, which have spread across the globe since World War II (Meyer 2010). Premarital and same-gender sex tend to be viewed more favorably because they meet the consensuality ideal. In contrast, extramarital sex violates the contract of marriage, often without the consent of the other spouse, and teenage sex involves decisions made before reaching maturity and often without the consent of parents who have responsibility for the teen's welfare. Changes across cohorts should therefore be greater for the former than the latter.

A second key normative theme is hegemonic heterosexuality—the ways that heterosexuality is privileged and taken for granted (Callahan and Vescio 2011; Rich 1980). A growing literature demonstrates how monogamous heterosexuality is reproduced, managed, and normalized in everyday life (e.g., Martin 2009). The social privilege of heterosexuality implies more positive views of premarital sex than same-gender sex, even though both meet ideals of consensuality. Changes across cohorts should thus occur more quickly for attitudes toward premarital sex than same-gender sex. Also, the traditional norms of masculinity in sexual behavior (Petersen and Hyde 2010, 2011) may mean that men are slower than women to approve of same-gender sex (Kite and Whitely 1996).

Hypotheses

The diffusion arguments about the nature of changes in sexual attitudes lead to two hypotheses:

- *Hypothesis 1:* In older cohorts, tolerant sexual attitudes emerge among groups with high SES, thus creating divergence in views, while in younger cohorts, tolerance spreads more widely, thus creating convergence in views.
- *Hypothesis 2:* Given dominant heterosexual ideals, diffusion should produce greater change in the determinants of attitudes toward premarital sex than same-gender sex, and given consensuality ideals, diffusion should produce greater change in the determinants of premarital and same-gender sex than extramarital and teen sex.

Methods

Tests of the hypotheses use the General Social Survey (GSS) from 1972 to 2014 to examine (1) individual-level relationships, (2) trends over time, and most importantly (3) variation in individual-level relationships across time. The GSS of the United States (NORC 2015) has asked questions about sexual attitudes in 25 surveys from 1972 to 2014 and for cohorts born from the late 1880s to the late 1980s. The question on teen sex began in 1986 and has data for 17 surveys. The surveys cover a wide period of change in sexual attitudes and, except for some early years, are based on full probability samples of the noninstitutionalized U.S. adult population (Smith, Marsden, and Hout 2015). To measure SES meaningfully, however, the analyses include only persons 25 and older.

Measures

The GSS asks about whether the following are always wrong, almost always wrong, wrong only sometimes, or not wrong at all: (1) a man and woman having sex before marriage, (2) teens ages 14 to 16 having sex before marriage, (3) married persons having sex with someone other than their own partner, and (4) sexual relations between adults of the same sex.² These questions tap moral acceptance of nonmarital sexual behavior and differ from questions on support for the civil rights of sexual minorities.

Cohort measures single years of birth, excepting the first category of 1900 or earlier and the last category of 1985 or later. The models treat cohort effects as a quadratic, but for interpretation ease, I transform units into decades since 1900 (from 0.0 for 1900 to 8.5 for 1985). Bayesian Information Criterion statistics indicate that the two quadratic cohort terms perform nearly as well as a set of 9 dummy variables for 10-year cohorts, and require fewer interactions to test the hypothesis. Year is measured from 1972 to 2014, and age is measured in 5-year age categories (25–29, 30–34 . . . 75–79, 80+). As Brooks and Bolzendahl (2004) note, life-course measures of family, work, and income also capture the effects of age.

The other sociodemographic determinants fall into two categories. One category comprises largely stable characteristics determined at birth or by early adulthood. Regardless of the age at which they are measured, gender, race, and education (provided that it is measured past age 25) likely contribute to formation of values in youth and young adulthood that shape attitudes throughout the later life course. Gender takes the form of a dummy variable with

²In 1991, 1994, 1998, and 2008, questions on premarital, extramarital, and homosexual sex were asked after a slightly different introduction and offered another choice of “can’t say.” To be cautious, these measures are not used in the analysis.

males coded one, and race takes the form of two dummy variables for African Americans and others (with whites as the referent). Education equals completed years of schooling (divided by 10) and ranges from 0 (no formal schooling) to 2.0 (20 years of schooling or postgraduate degree).

Because the educational system has expanded over the past century, the same number of years of schooling may have different meanings across time. Education may have less influence on attitudes when access to advanced schooling is less selective and high levels of schooling are less distinctive. To adjust for these changes, I also measure respondents' education relative to the mean of their cohort, which is set to equal zero. Positive scores thus indicate that respondents have attained schooling above the average of those born in the same year. Because the relative measure captures only variation within cohorts, it controls for changes in access to schooling.

The second category of predictors provides less direct information on early life experiences. Collected at the time of a survey, current marital status, occupational prestige, family income, residence, and the like often have changed greatly over the life course. However, they likely will influence current attitudes toward sexual behavior in ways that may differ across cohorts. For example, equivalent income in adulthood may translate into varying levels of tolerance for sexual behavior across cohorts at different stages of diffusion.

Region of residence takes the form of eight dummy variables created from categories of similarly located states. The size of city of residence is based on GSS-defined categories that range from 1 (open country) to 10 (city with population greater than 250,000). A dummy variable measures married versus other categories, and a continuous variable reflects the respondent's number of children (up to eight or more). A dummy variable indicates those who are employed or in school (coded one) compared to those who are unemployed, keeping house, retired, or otherwise not working. Prestige of current or former occupation is coded on the basis of a scale constructed from ratings of the general social standing of occupations (Smith, Marsden, and Hout 2015). Current family income in dollars is derived from categories ranging from under \$1000 to over \$150,000, with the values recoded to the category's midpoint and adjusted for inflation. The midpoints used for the top open-ended categories are recommended by Hout (2004), who downwardly adjusts the usual Pareto-formula estimates. Religiosity is measured as church attendance (in nine categories ranging from never [0] to several times a week [8]) and as a set of dummy variables representing seven religious traditions plus a category for no religion (Steensland et al. 2000). Political views are measured in seven categories ranging from extremely liberal (1) to extremely conservative (7).

Models

A linear mixed-model approach to the analysis of age, period, and cohort effects (Yang and Land 2006) is well suited to testing hypotheses about cohort changes in SES effects. The model treats cohort and cohort-squared, SES measures, and control variables as determinants of the outcome measures. Individual data are nested within cells created by the cross-classification of period and age. Using a cohort quadratic with 5-year age groups and

single-year periods to minimize dependency, the level-1 or within-cell model takes the following form:

$$Y_{ijk} = \beta_{0jk} + \beta_1 * Cohort_{ijk} + \beta_2 * Cohort_{ijk}^2 + \beta_3 * SES_{ijk} + \beta_4 * Cohort_{ijk} * SES_{ijk} + \beta_5 * Cohort_{ijk}^2 * SES_{ijk} + \sum \beta_m * X_{mijk} + e_{ijk},$$

where i refers to individuals within j age groups and k years, X to m control variables, and e to a normally distributed error with a mean of zero and variance of σ^2 . The product terms allow for nonlinear changes across cohorts in the effects of the SES measures of education, occupational prestige, and income. With the intercept assumed to vary randomly, the level-2 or between-cell model takes the following form:

$$\beta_{0jk} = \gamma_0 + u_{0j} + v_{0k},$$

where γ_0 is the model intercept or adjusted mean outcome; u_{0j} is the residual random effect of age group j on β_{0jk} averaged over all periods, which is assumed to be normally distributed with mean 0 and variance τ_u ; and v_{0k} is the residual random effect of period k on β_{0jk} averaged over all ages, which is assumed to be normally distributed with mean 0 and variance τ_v . The model thus allows for estimation of cohort effects with random effect controls for age group and period.³

The slope coefficients β_1 through β_m are treated as fixed. The diffusion hypothesis predicts that the SES by cohort coefficient β_4 should be positive (reflecting the initial strengthening of differences across older cohorts) and the SES by cohort squared coefficients β_5 should be negative (reflecting weakening of differences). The estimates come from xtmixed in Stata 13.1. The analyses use GSS weights for oversampling and response bias in the descriptive statistics but not for the multilevel models.⁴

The models use multiple imputation for missing data, which exceed 10% for occupational prestige, income, and political views and, according to the Little test, are not missing completely at random. Using multivariate normal imputation for all variables in the model with missing data and an iterative MCMC method for data augmentation (mi impute mvn in Stata), the multilevel models average estimates across 20 imputations. The outcome variables are used to help impute other variables but are not imputed themselves (Allison 2009). The complete case models include 21,868 to 22,540 cases, while the multiple imputation models include 30,124 to 31,342 cases – a substantial increase that may help minimize selection bias from missing data.⁵

³The models assume linear relationships with the four-category measures of sexual attitudes. Checks show that the key interaction results are replicated in ordered logit models.

⁴Much debate exists over the ability to separate age, period, and cohort effects using the Yang and Land hierarchical model (Bell and Jones, 2013, 2014, 2015; Reither et al., 2015). Although I report the mixed models estimates, the findings do not appear dependent on the estimation technique. Single-level regression models that avoid the APC dependency by including only cohort and fixed effects for year give much the same results, as do regression models using 10-year age groups and 5-year periods.

⁵Checks show that the key interaction results are replicated in models without imputation of missing data. For example, the effects on premarital sex of education by cohort and cohort squared as reported in Table 4 equal .192 ($t = 6.19$) and $-.026$ ($t = -6.85$). Without the imputation, the coefficients equal .221 ($t = 5.20$) and $-.030$ ($t = -5.83$). These and other coefficients are similar in size and significance both without and with multiple imputation.

Results

Table 1 presents descriptive statistics for the variables. The means show that tolerance is highest for premarital sex (2.74), followed by same-gender sex (1.85), teen sex (1.44), and extramarital sex (1.34). About 61% say premarital sex is sometimes wrong or not wrong at all, while the figures are 29% for same-gender sex, 12% for teen sex, and 9% for extramarital sex. Figure 1 graphs the mean values by cohort and, with the exception of extramarital sex, illustrates a steady increase in tolerance from cohorts born around 1900 to those born in the 1980s. The acceptability of premarital sex begins at higher levels but levels off in recent cohorts, while acceptance of same-gender sex has risen more in recent cohorts. The two trends indicate convergence in attitudes. Acceptance of teen sex increases only slightly and remains at a low level. Extramarital sex shows a slight rise among baby boom cohorts but a decline afterward. The trends by year in Figure 1 show much the same pattern, although the trends are smoother and fluctuate less.

The relative contributions of year (within-cohort change) and cohort (between-cohort change) come from the linear regression coefficients (Firebaugh 1997). The numbers in Table 2 first list the linear change in each outcome over the full time period from 1972–73 to 2014 and then list the change occurring within and between cohorts. The numbers demonstrate that the major change comes from cohort replacement. For premarital, extramarital, and teen sex, the year coefficient is negative and indicates that within-cohort, individual change tends to reduce tolerance. Only for same-gender sex does within-cohort change increase tolerance, but here again cohort replacement accounts for most of the change.

Table 3 presents the effects of the predictors on the four outcome measures. These results replicate existing studies. Generally, support for non-traditional sexual behavior is higher for unmarried persons with fewer or no children. Men compared to women are more accepting of premarital and extramarital sex but less accepting of same-gender sex. High SES groups tend to be more accepting, with consistent positive effects for education, less consistent but generally positive effects for income and employment, and little effect for job prestige. The positive effects of education are larger for same-gender sex ($b = .562$) – and reflect greater divisions in views – than for premarital sex ($b = .164$), extramarital sex ($b = .201$), or teen sex ($b = .113$).

Those living in larger cities are also more accepting. For religion, those attending church more often and Evangelical Protestant are less accepting, while Black Protestants, Mainline Protestants, Catholics, and Jews are accepting of premarital sex but not same-gender sex. Those with more conservative views are less accepting of all four forms of non-traditional sexual behavior. Across all predictors, church attendance has the strongest effects (standardized coefficients range from $-.142$ to $-.334$) followed by political views ($-.094$ to $-.175$), education ($.033$ to $.138$), and married ($-.070$ to $-.092$). To illustrate the interaction tests, the table also includes terms for education by cohort and education by cohort squared.

Table 4 summarizes the interactions with cohort for four measures of SES—education, cohort-centered education, occupation, and income—and the four outcome measures. The

full equations include controls for the other variables in Table 3, but to present the key information efficiently, Table 4 lists only the effects for the SES measure, cohort, cohort squared, SES times cohort, and SES times cohort squared. The variables are centered so that the effect of the SES measures in the table is similar to the effect in a model without the interaction terms. The estimates also control for the random effects of age and year.

First, for premarital sex, cohort shows a positive effect ($b = .310$, $p < .001$) that, when considered in combination with the negative sign of cohort squared ($b = -.020$, $p < .001$), indicates increasing tolerance that levels off among the more recent cohorts. The cohort coefficients for same-gender sex, however, show little leveling off. The significant cohort effect ($b = .083$) means that support rises across cohorts but the insignificant cohort squared effect ($b = .002$) means that the trend likely does not level off.

Next, the interaction terms generally have the hypothesized signs and reach statistical significance. First consider education. The positive signs of the coefficients for education by cohort mean that the effects increase across cohorts, at least initially. For pre-marital sex, the coefficient of .192 for cohort times education means that the average positive effect of education ($b = .164$) rises in newer cohorts. This result implies widening differences in views across cohorts. The negative signs of the coefficients for SES by cohort-squared mean that the positive effects level off and may even reverse for cohorts born in later years. Again for pre-marital sex, the coefficient of $-.026$ for cohort squared times education means that the positive effect of education eventually gets weaker in the newest cohorts. This implies narrowing or reversing of education differences in younger cohorts. In short, differences in tolerance of diverse sexual behavior first widen and then narrow.

For the other SES measures, cohort-centered education and occupational prestige show the same pattern. The positive interaction coefficients with cohort and the negative interaction coefficients for cohort squared imply a strengthening of effects followed by declining effects. However, income represents an exception—its effects change little compared to those of education or occupational prestige.

To illustrate the trends implied by the coefficients, Figure 2 graphs the predicted slopes for one SES measure, education, on each outcome measure across all cohorts. It also plots the actual slope of education estimated within each 10-year cohort.⁶ For tolerance of premarital sex, cohorts born near the turn of the century show near-zero effect of education. The predicted education slopes initially grow, peaking at 0.245 for the cohort born in 1937 (i.e., those reaching college age around 1956). The slopes then steadily decline and fall below zero for cohorts born in the 1970s and 1980s. The predicted slopes for the youngest cohort are negative, implying a reversal in the education-tolerance relationship, but one that is based on a relatively small sample and early stage of the life course. Among the oldest cohorts, near-zero coefficients reflect low tolerance of premarital sex across all educational levels; for cohorts born in the 1930s and 1940s, positive coefficients mean that tolerance is stronger among high-education groups than low-education groups; and among the younger

⁶The estimates come from multilevel models with imputed data but use dummy variables for the 10-year cohorts rather than the continuous cohort terms.

cohorts, the near-zero or negative coefficients show few differences or more tolerance among low-education groups.

For tolerance of extramarital sex, the pattern of change in the slope of education appears similar to that for tolerance of premarital sex but the extent of the change is smaller. Despite lower acceptance for extramarital sex than premarital sex, both outcomes show an increase and reversal across cohorts in the effect of education. However, in accord with its more limited acceptance, the effect of education on acceptance of extramarital sex varies less across cohorts than the effect on acceptance of premarital sex.

For tolerance of same-gender sex, the slope for education rises and begins to reverse. This pattern likely reflects the more recent changes in attitudes toward same-gender sex and the more polarized attitudes. The effect of education has become stronger as more educated persons take the lead in approving of same-gender sex (note that the graph uses a different scale to capture this strong effect). Diffusion from more educated groups to others appears to have emerged but attitudes are still polarized. Both the curve for the predicted educational slopes and the discrete estimates of the effect of education show a weakening among recent cohorts. The findings suggest that divisions between educational groups may decline further in future cohorts.

For tolerance of teenage sex, changes in the effect of education are small and reveal only a limited rise. Acceptance of teenage sex represents an exception, as none of the interaction coefficients reach statistical significance. The truncated period of the measure and the widespread concern about the negative consequences of teenage childbearing do little to change the positive effect of education.

Discussion

Analysis of over-time data from the GSS on tolerance of diverse forms of sexual behavior in the United States reveals both general and outcome-specific findings. In general terms, multiple measures of SES consistently influence tolerance of sexual behavior but also have varied effects across cohorts, the influence being strongest among cohorts born in the 1930s and 1940s. For cohorts born early in the century, when norms restricting sexual intimacy to marriage were strong, SES differences in attitude were weak, as all groups opposed nonnormative behavior. Cohorts that reached adolescence and young adulthood when norms were changing showed the strongest effects of SES. High SES groups took the lead in advocating tolerance for sexual behaviors outside marriage, which translates into stronger SES effects. Cohorts born most recently, after norms for sexual intimacy had changed greatly and often diffused throughout the population, showed weaker effects of SES, as all groups began to accept certain sexual behaviors outside of marriage.

However, the results vary across type of sexual behavior. The diffusion model of change most clearly fits tolerance of premarital sex. This outcome shows the predicted rise and decline in the effects of SES across cohorts. It also shows the most change over past decades and the highest level of tolerance. The effects of SES are strongest for cohorts born in the 1930s and 1940s and coming of age in the 1950s, before tolerance reached a tipping point.

Not coincidentally, the change toward greater tolerance began among cohorts reaching young adulthood around the time of the introduction of the pill. Education, and SES more generally promoted tolerant views of premarital sex even in unsupportive environments, while widespread diffusion occurred as pregnancy risks of premarital sex declined. The results suggest that diffusion arguments apply most to sexual behavior involving adult autonomy and heterosexual hegemony. Premarital sex meets both criteria; hence its high level of acceptance and diffusion from high to low SES groups.

The findings for tolerance of same-gender sex show initial evidence of a weakening of the effects of SES across cohorts, which may reflect the early stages of diffusion. The effects of SES grow steadily from older cohorts, who largely oppose same-gender sex, to younger cohorts, who show strong status differences. However, the rising effects of status appear to be reversing among the most recent cohorts. Although it is too early to say, the trend may indicate the start of the reversal that the diffusion theory predicts. The later emergence of change for tolerance of same-gender sex than tolerance of premarital sex stems from the strength of heterosexual norms, which are changing more slowly than norms forbidding premarital sex.

The findings for tolerance of extramarital and teenage sex show only weak evidence of diffusion. Given that both behaviors violate norms of autonomy and consent among adults, they have not become well accepted. The evidence indicates a slight rise and decline in the effects of SES on tolerance of extramarital and teenage sex, but the degree of change is quite small compared to that for tolerance of premarital and same-gender sex. While heterosexual norms have weakened to some degree, norms of autonomy and consent have remained strong.

Implications

To make sense of the findings from a diffusion-of-innovations perspective, we need to see tolerant views of nonnormative sexual behavior as an innovation. Much like other innovations, these views emerge and spread through society on the basis of SES-based divisions. The diffusion-of-innovations approach provides a broad framework that can link sexual tolerance to other types of value shifts. As Fischer and Hout (2006) demonstrate, such patterns have similarities to the spread over the past century of other ideas, values, and beliefs relating to fertility, divorce, and gender equality.

Empirically, this study innovates by examining differences across cohorts rather than years, modeling the varying effects of SES by cohort, and testing for nonlinear interactions. Making comparisons across cohorts more fully exploits the potential for change to occur across groups born and socialized in different historical periods. And modeling interactions between cohort and SES captures the diffusion of attitudes. A stable measure of SES like education has advantages for testing cohort-based changes, but relationships with occupational prestige are also consistent with the arguments.

More generally, the results support a theory of change in which the social distribution of sexual attitudes changes along with the overall level of acceptance of nonmarital or non-normative sexual behaviors. Compositional arguments, which specify constant relationships

between socioeconomic characteristics and attitudes but growth in the size of more tolerant groups, receive some support. However, the effects of cohort net of controls for socioeconomic characteristics indicate something more than composition is involved. The interaction of cohort and SES suggest that value changes occurring across generations differentially affect SES groups. A theory that captures the rising and declining salience of social divisions gives added insight into the process of change in sexual attitudes.

The diffusion theory complements theories that describe the broad nature of changes in values but say little about how the processes of change occur. Changes in attitudes toward sexual behavior can be seen as part of societal shifts toward greater tolerance (Stouffer 1955; Hyman and Wright 1979), new values relating to family, fertility, gender roles, and sexual identity (Inglehart 1989; Lesthaeghe 2010), and de-traditionalization and individualization of traditional values (Beck 1992; Giddens 1992). These broad changes are related to technological, economic, and structure changes; access to effective contraceptives and reduced costs of premarital sexual behavior play a crucial role as well. The results presented here on sexual attitudes are consistent with these theories but offer more specifics on the process of change. The diffusion theory says more about how societies move from more traditional values to more tolerant, individualized, and non-familial values.

Limitations

Several limitations in the available GSS data suggest the need for additional research. First, the data allow only for the indirect study of diffusion. The patterns of change in SES differences are consistent with initial adoption of tolerant attitudes by innovative postmaterialist groups and later, more global, diffusion. Other types of data and analyses that directly measure the historical conditions relevant to sexual tolerance are needed to more fully validate claims about diffusion and cohort change. Second, the results apply to specific measures of tolerance of sexual behavior. The measures are suited for the analysis of long-term change and, in fact, are the only ones available over several decades. But measures of civil rights or legalized marriage would likely produce different results. Although the questions on moral tolerance are general enough to elicit both support and opposition, they allow for only preliminary support of the cohort approach. Developing future data sets that replicate a wide set of questions for national samples can extend these findings. Third, the results apply to only one country and need to be extended beyond the United States. Another approach might involve comparing nations at different stages of the adoption of tolerant attitudes. High-income countries might differ from low- and middle-income countries not only in tolerance for sexual behaviors outside marriage but also in the size of the relationships with SES. Cohort differences in the SES distribution of sexual tolerance would reveal whether tolerance has diffused from high to low SES groups as it has in the United States. Fourth, estimating age, period, and cohort effects with cross-classified mixed models (Yang and Land, 2006) has generated controversy (Bell and Jones, 2013, 2014, 2015; Reither et al. 2015). The cohort interactions presented here appear to be robust and show in models that exclude age and use measures related to family, work, and religion to capture life course effects directly. Still, caution is warranted whenever cohort trends are studied.

Conclusion

Despite the limitations, the evidence that the influence of education, occupation, and (to a lesser extent) income on sexual attitudes changes across cohorts provides new insights into processes of social change. While separate literatures on sexual attitudes focus on either the trends over time or the cross-sectional influence of individual sociodemographic characteristics, both types of influences should be considered jointly. Such an approach demonstrates that high SES groups take the lead in adopting new attitudes toward sexual behavior and that other groups follow after a lag. The process of change fits predictions of a diffusion model that helps explain changes in other attitudes (Hout and Fischer 2006; Pampel 2011a). The findings move beyond the description of average relationships between social characteristics and attitudes to treat these relationships as part of a dynamic framework that describes how the relationships vary across cohorts or time. The approach helps make sense of contrasting findings, with some studies claiming that social groups are becoming more alike in their views on sexual attitudes and others claiming that that social groups are become more dissimilar. As the findings demonstrate, the extent of divergence and convergence depends on the type of attitude and the cohort. For premarital sex, attitudes for older cohorts reflect strong divisions that are disappearing for younger cohorts, while for same-gender sex, attitudes for older cohorts were similar in opposition and for younger cohorts reflect growing divisions. This approach makes it hard to provide a simply summary of the trends and divisions but describes the nature of the changes in diverse sexual attitudes more accurately.

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Biography

Fred Pampel is Research Professor of Sociology and Senior Research Associate of the Institute of Behavioral Science at the University of Colorado Boulder. His research focuses on disparities in health behaviors such as smoking, cohort-based changes in social values, and methods for program intervention and evaluation.

Figure 1.
Year and Cohort Trends in Sexual Attitudes

Figure 2.

Predicted Effects of Education on Sexual Attitudes Across Cohort (Year of Birth)

- Premarital Sex
- Extramarital Sex
- Same-Gender Sex
- Teen Sex

Source: The predicted education slope is calculated from the coefficients presented in Table 4 for cohort, cohort squared, education, education times cohort, and education times cohort squared. It shows the expected effect of education on each outcome for each cohort.

Table 1

Descriptive Statistics: GSS 1972–2014

Sexual Attitudes	N	Mean	SD	Min	Max
Prenatal	31230	2.74	1.26	1	4
Extramarital	31342	1.34	0.70	1	4
Same-Gender	30124	1.85	1.27	1	4
Teenage	21210	1.44	0.80	1	4
Predictors					
Cohort (decades)	52675	4.56	1.94	0	8.5
Age	52675	47.85	15.58	25	89
Year	52876	1993	12	1972	2014
Male	52876	0.45	0.50	0	1
Black	52876	0.12	0.33	0	1
Other Race	52876	0.05	0.23	0	1
Education (decades)	52729	1.28	0.33	0	2
Married	52853	0.67	0.47	0	1
#Children	52718	2.20	1.78	0	8
Region	52876	4.89	2.47	1	9
City Size	52876	6.53	2.89	1	10
Employed	52863	0.63	0.48	0	1
Occupational Prestige	21096	40.09	13.99	12	82
Income (\$1000)	47602	68.84	51.01	0.5	254
Church Attendance	52360	3.90	2.73	0	8
Black Protestant	52646	0.08	0.27	0	1
Evangelical Protestant	52646	0.24	0.43	0	1
Mainstream Protestant	52646	0.21	0.41	0	1
Catholic	52646	0.25	0.44	0	1
Jewish	52646	0.02	0.14	0	1
Other	52646	0.06	0.23	0	1
Unaffiliated	52646	0.04	0.19	0	1
None	52646	0.10	0.30	0	1
Political Views	44722	4.17	1.36	1	7

Table 2

Decomposition of Linear Cohort Changes in Sexual Attitudes

Sexual Attitudes	Decomposition		
	Total Change	Within Cohort	Between Cohort
Premarital	0.59	−0.23	0.81
Extramarital	−0.17	−0.33	0.16
Same-Gender	1.05	0.47	0.57
Teenage	0.06	−0.16	0.22

Table 3
Unstandardized Coefficients and t-Ratios for Mixed Age, Period, and Cohort Models of Sexual Attitudes

Predictors	Premarital Sex		Extramarital Sex		Same-Gender Sex		Teenage Sex	
	b	t	b	t	b	t	b	t
Male	0.165	13.39 ***	0.081	10.04 ***	-0.197	-15.42 ***	0.118	10.85 ***
Black	-0.070	-2.51 *	0.068	3.76 ***	-0.343	-11.82 ***	-0.048	-2.11 *
Other Race	-0.155	-5.24 ***	0.039	2.10 *	-0.224	-7.46 ***	-0.011	-0.49
Cohort	0.310	21.52 ***	0.049	3.94 ***	0.083	4.84 ***	0.092	5.23 ***
Cohort ²	-0.020	-12.86 ***	-0.013	-11.93 ***	0.002	1.32	-0.005	-2.71 **
Education	0.164	6.40 ***	0.201	12.13 ***	0.562	21.40 ***	0.113	4.91 ***
Married	-0.163	-11.84 ***	-0.142	-15.90 ***	-0.184	-12.95 ***	-0.112	-9.31 ***
# Children	-0.022	-6.01 ***	-0.004	-1.86	-0.022	-5.74 ***	-0.014	-4.22 ***
Mid Atlantic	-0.039	-1.27	-0.008	-0.39	-0.205	-6.37 ***	0.000	0.00
East N Central	-0.150	-5.03 ***	-0.122	-6.23 ***	-0.304	-9.69 ***	-0.118	-4.43 ***
West N Central	-0.123	-3.59 ***	-0.127	-5.62 ***	-0.278	-7.72 ***	-0.094	-3.10 ***
South Atlantic	-0.214	-7.11 ***	-0.088	-4.44 ***	-0.331	-10.42 ***	-0.084	-3.15 ***
East S Central	-0.364	-10.07 ***	-0.119	-5.05 ***	-0.462	-12.35 ***	-0.132	-4.16 ***
West S Central	-0.282	-8.56 ***	-0.118	-5.39 ***	-0.424	-12.17 ***	-0.100	-3.47 ***
Mountain	-0.191	-5.33 ***	-0.124	-5.29 ***	-0.255	-6.80 ***	-0.037	-1.19
Pacific	-0.078	-2.50 *	-0.079	-3.85 ***	-0.174	-5.31 ***	-0.003	-0.12
City Size	0.021	9.37 ***	0.012	8.50 ***	0.023	9.91 ***	0.009	4.49 ***
Employed	0.038	2.60 **	0.026	2.75 **	0.036	2.38 *	0.005	0.39
Occup. Prestige	0.004	0.74	0.002	0.51	0.042	7.44 ***	0.004	0.75
Income	0.002	10.05 ***	0.000	4.32 ***	0.002	10.97 ***	0.000	0.89
Church Attend	-0.150	-60.63 ***	-0.038	-23.43 ***	-0.080	-31.24 ***	-0.041	-18.7 ***
Black Protestant	0.215	5.75 ***	-0.147	-5.97 ***	-0.283	-7.21 ***	-0.156	-4.97 ***
Evan. Protestant	-0.317	-12.83 ***	-0.252	-15.57 ***	-0.567	-22.12 ***	-0.321	-15.4 ***
Main Protestant	0.070	2.89 **	-0.207	-13.05 ***	-0.345	-13.68 ***	-0.252	-12.0 ***
Catholic	0.147	6.16 ***	-0.181	-11.55 ***	-0.281	-11.24 ***	-0.239	-11.9 ***
Jewish	0.192	4.30 ***	-0.030	-1.00	0.215	4.44 ***	-0.115	-2.85 **
Other	-0.299	-9.16 ***	-0.147	-6.97 ***	-0.303	-9.01 ***	-0.244	-9.09 ***

Predictors	Premarital Sex		Extramarital Sex		Same-Gender Sex		Teenage Sex	
	b	t	b	t	b	t	b	t
None	−0.077	−2.18 *	−0.202	−8.73 ***	−0.393	−10.68 ***	−0.287	−9.94 ***
Political Views	−0.120	−25.57 ***	−0.047	−15.06 ***	−0.161	−33.46 ***	−0.074	−18.4 ***
Cohort x Education	0.192	6.19 ***	0.085	4.12 ***	0.302	9.15 ***	0.042	1.08 ***
Cohort ² x Educ.	−0.026	−6.85 ***	−0.012	−4.89 ***	−0.025	−6.28 ***	−0.003	−0.71 ***
Constant	3.921	86.82 ***	1.843	44.68 ***	3.554	63.39 ***	2.189	56.40 ***
Random Effects	var	se	var	se	var	se	var	se
Age	0.027	0.01	0.112	0.027	0.056	0.015	0.031	0.011
Year	0.085	0.02	0.051	0.010	0.158	0.025	0.054	0.012
N	31,230		31,342		30,124		21,210	

*
p < .05
**
p < .01

p < .001

Table 4
Unstandardized Coefficients for Cohort by SES Interactions for Age, Period, and Cohort Models of Sexual Attitudes

Predictors	Premarital Sex		Extramarital Sex		Same-Gender Sex		Teen Sex	
	b	t	b	t	b	t	b	t
Cohort	0.310	21.52 ***	0.049	3.94 ***	0.083	4.84 ***	0.092	5.23 ***
Cohort ²	-0.020	-12.86 ***	-0.013	-11.93 ***	0.002	1.32	-0.005	-2.71 **
Education	0.164	6.40 ***	0.201	12.13 ***	0.562	21.40 ***	0.113	4.91 ***
Cohort x Education	0.192	6.19 ***	0.085	4.12 ***	0.302	9.15 ***	0.042	1.08
Cohort ² x Education	-0.026	-6.85 ***	-0.012	-4.89 ***	-0.025	-6.28 ***	-0.003	-0.71
Cohort	0.322	24.39 ***	0.076	6.42 ***	0.091	5.89 ***	0.096	5.81 ***
Cohort ²	-0.021	-14.50 ***	-0.015	-14.82 ***	0.003	1.91	-0.005	-2.90 *
Relative Education	0.047	6.09 ***	0.061	12.10 ***	0.166	20.74 ***	0.032	4.69 ***
Cohort x Rel. Education	0.041	3.62 ***	0.028	3.84 ***	0.111	9.29 ***	0.012	0.90
Cohort ² x Rel. Education	-0.006	-4.60 ***	-0.004	-4.87 ***	-0.010	-7.37 ***	-0.001	-0.65
Cohort	0.303	22.53 ***	0.048	3.95 ***	0.034	2.14 *	0.082	4.94 ***
Cohort ²	-0.020	-13.36 ***	-0.013	-12.51 ***	0.007	4.18 ***	-0.004	-2.31 **
Occupational Prestige	0.003	0.58	0.001	0.34	0.042	7.55 ***	0.004	0.79
Cohort x Occ. Prestige	0.034	3.97 ***	0.016	2.84 **	0.060	6.74 ***	0.002	0.20
Cohort ² x Occ. Prestige	-0.005	-4.53 ***	-0.002	-3.64 ***	-0.006	-5.42 ***	0.000	-0.05
Cohort	0.306	20.83 ***	0.041	3.29 ***	0.045	2.60 **	0.079	4.34 ***
Cohort ²	-0.020	-12.83 ***	-0.012	-11.32 ***	0.006	3.53 ***	-0.004	-1.96 *
Income	0.002	9.71 ***	0.001	5.24 ***	0.002	10.27 ***	0.000	0.99
Cohort x Income	0.000	1.31	0.000	-1.13	0.001	4.69 ***	0.000	-0.62
Cohort ² x Income	0.000	-1.55	0.000	-0.01	0.000	-4.23 ***	0.000	0.79
N	31,230		31,342		30,124		21,210	

*
p < .05

**
p < .01

p < .001