

Articles continued

Demography of Sexual Orientation in Adolescents

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ABSTRACT. This study was undertaken to explore patterns of sexual orientation in a representative sample of Minnesota junior and senior high school students. The sample included 34 706 students (grades 7 through 12) from diverse ethnic, geographic, and socioeconomic strata. Five items pertaining to sexual attraction, fantasy, behavior, and affiliation were embedded in a self-administered survey of adolescent health. Overall, 10.7% of students were "unsure" of their sexual orientation; 88.2% described themselves as predominantly heterosexual; and 1.1% described themselves as bisexual or predominantly homosexual. The reported prevalence of homosexual attractions (4.5%) exceeded homosexual fantasies (2.6%), sexual behavior (1%), or affiliation (0.4%). Gender differences were minor; but responses to individual sexual orientation items varied with age, religiosity, ethnicity, and socioeconomic status. Uncertainty about sexual orientation diminished in successively older age groups, with corresponding increases in heterosexual and homosexual affiliation. The findings suggest an unfolding of sexual identity during adolescence, influenced by sexual experience and demographic factors. *Pediatrics* 1992;89:714-721; *sexuality, sexual orientation, adolescence, homosexuality, heterosexuality.*

Patterns of sexual orientation in human populations have long interested social scientists, epidemiologists, and sexologists. Beyond the understanding of human sexuality, the demography of sexual orientation has practical applications to urgent public health problems such as acquired immunodeficiency syndrome. For example, the size of the US human immunodeficiency virus epidemic was projected from Kinsey's nearly half-century-old estimates of male homosexuality, as well as newer data on human immunodeficiency virus seroprevalence in homosexual populations.¹

In the early 1900s, pioneering sexologists in Europe and the United States studied male homosexual behavior in small, convenience samples of students and tradesmen.²⁻⁴ Intrigued by their findings, Kinsey and colleagues⁵ set out to interview more than 6000 adolescent and adult men from diverse social networks across the United States. Based on their comprehensive sexual histories, the investigators projected that 4% of men were exclusively homosexual throughout

their lives and 10% were more or less exclusively homosexual for at least 3 years. Four years later, they published a comparable study of American women,⁶ the estimated prevalence of homosexuality being about half of corresponding male figures.

Since then, there has been little new information on the sexual orientation of adolescents. In 1973, Sorenson⁷ found that 17% of boys and 6% of girls between the ages of 16 and 19 years reported at least one homosexual experience. The 1988 National Survey of Adolescent Males, drawing from a representative sample of noninstitutionalized, never-married males between the ages of 15 and 19 years, found that 3% of young men "had engaged in homosexual activity."⁸

Available data on human sexual orientation are primarily derived from adult populations and studies that are limited by sample biases, missing data, and a singular focus on sexual behavior. Kinsey and other scholars^{9,10} have emphasized that sexual orientation encompasses other aspects of sexuality such as fantasies, emotional attractions, and cultural affiliation, as well as sexual behavior. The relative heterosexual or homosexual direction of each dimension may be inconsistent with the others, defying dichotomous classification of individuals. Adopting this theoretical perspective, we aimed to explore the broader phenomenon of sexual orientation among male and female adolescents, examining individual dimensions of sexual fantasies, attractions, behaviors, and affiliation in relation to demographic variables.

MATERIALS AND METHODS

Subjects

Participants in the study were 36 741 Minnesota public school students in grades 7 through 12, approximately 10% of the overall student body. The final weighted sample included 34 706 cases, almost equally divided between males (49.8%) and females (50.2%) from metropolitan (urban and suburban) Minnesota (51.5%) and (rural) Greater Minnesota (49.5%). Ages ranged from 12 to 20 years; 98.9% of students were 18 years of age or younger. The majority (94.2%) of the students were white, and 5.8% (n = 1986) were black, Hispanic, Native American, or Asian/Pacific Islander. Socioeconomic status, based on parental education and employment, was dichotomized as higher or lower for the purpose of the following analyses. Approximately half of subjects (50.6%) fell within higher socioeconomic strata, and 49.4% within the lower strata. While 89.2% of students considered themselves to be at least somewhat religious or spiritual, the rest (10.8%) did not.

Methods

Participants responded to five self-administered true-false or multiple-choice questions regarding sex-

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ual orientation, embedded in the larger Minnesota Adolescent Health Survey, consisting of 189 items on health and psychosocial status. The sexual orientation questions, listed in Table 1, tapped the following dimensions of sexual orientation: sexual fantasy, sexual behavior with males and with females, sexual orientation self-identification, and attractions and intended sexual behavior.

Participation in the survey was voluntary, anonymous, and confidential. Surveys were administered by project staff in classroom settings in 1986–1987. Parents were informed of the project and given an opportunity to refuse students' participation. The procedures were approved by the University of Minnesota Institutional Review Board.

Sampling Design

The Adolescent Health Database Survey employed a modified stratified cluster sampling design. A random sample of school districts (representing one third of all Minnesota districts) was designated by the Minnesota Department of Education as eligible for participation in the study. These districts were subsequently stratified into six levels: (1) urban school districts (Minneapolis, St Paul, and Duluth); (2) metropolitan suburban school districts; and (3) nonmetropolitan districts with more than 2000 students; (4) 1000 through 1999 students; (5) 500 through 999 students; and (6) fewer than 500 students.

One of the three urban school districts (Minneapolis) conducted a complete census in order to include sufficient numbers of nonwhite students for analyses of ethnic differences, while the two others (St Paul

and Duluth) selected participating schools. The number of school districts randomly sampled from each of the suburban and nonmetropolitan strata (strata 2 through 6) were proportional to the number of students within the strata in relation to the overall state enrollment. School districts that declined to participate were replaced by others of similar size, location, and demographic composition.

Overall, 84 different districts participated, representing 49% of the total number that were invited. Final school district participation rates were greatest for the urban stratum (100%), followed by 62% and 61%, respectively, for strata 3 and 5; 53% for stratum 6; and 27% and 25% for strata 4 and 2. Of the 52 553 surveys that were distributed, 36 741 were completed and returned, yielding a minimum student response rate of 69%. Weights were applied to the data set to reflect the actual composition of the Minnesota student body according to grade level distribution, stratum, and geographic area.

Statistical Analyses

Guttman scaling (scalogram analysis), additive scaling, and factor analysis were used to determine whether the five individual sexual orientation items (Table 1) could be combined into a psychometrically sound, composite measure of orientation. None of the analyses, conducted separately for males and females and for older and younger adolescents, yielded minimally acceptable coefficients of reproducibility or scalability for Guttman scales, α -coefficients of internal consistency for additive scales, or unidimensional factor loadings. Consistent with the theoretical framework, it was concluded that the individual items constituted separate dimensions of sexual orientation warranting individual analysis.

Analyses of individual items included frequency distributions and cross-tabulations. χ^2 Analyses, *t* tests, analysis of variance, and post hoc tests of significance were conducted with SPSS X software using the University of Minnesota Cyber Mainframe Computer. Because of the size of the data set, the level of statistical significance was designated to be .001 to reduce the likelihood of type I error.

RESULTS

Respondent/Nonrespondent Analyses

Overall, 34 336 (99.9%) persons answered at least one of the five sexuality items (reproduced in Table 1). The response rates for individual questions were as follows: 95.7% for sexual orientation self-identification; 94.6% for sexual attractions/behavioral intent; 93% for sexual fantasy; and 84.5 and 85.1%, respectively, for sexual behavior with males and with females. The two sexual behavior questions were deleted from surveys in the Twin cities metropolitan schools, accounting for the relatively lower response rates. These items were deleted at the request of the school districts.

Demographic comparisons of respondents and nonrespondents for individual sexual orientation items are illustrated in Table 2. Briefly summarized, nonrespondents were significantly younger than re-

TABLE 1. Sexual Orientation Questions

Sexual fantasy
When you think or daydream about sex, do you think about:
a. Males
b. Females
c. Both?
Sexual behavior
Have you ever had <i>any kind</i> of sexual experience with a <i>male</i> ?
(answer yes or no)
Have you ever had <i>any kind</i> of sexual experience with a <i>female</i> ?
(answer yes or no)
Sexual orientation self-identification
Which of the following best describes your feelings?
a. 100% heterosexual (attracted to persons of the opposite sex)
b. Mostly heterosexual
c. Bisexual (equally attracted to men and women)
d. Mostly homosexual
e. 100% homosexual (gay/lesbian; attracted to persons of the same sex)
f. Not sure
Attractions/behavioral intent
Which of the following best describes your feelings?
a. I am <i>only</i> attracted to people of the <i>same</i> sex as mine, and I will only be sexual with persons of the same sex.
b. I am <i>strongly</i> attracted to people of the <i>same</i> sex and most of my sexual experiences will be with persons of the same sex as mine.
c. I am <i>equally</i> attracted to men and women and would like to be sexual with both.
d. I am <i>strongly</i> attracted to persons of the <i>opposite</i> sex and most of my sexual experience will be with persons of the opposite sex.
e. I am <i>only</i> attracted to persons of the <i>opposite</i> sex and I will only be sexual with persons of the opposite sex.

TABLE 2. Demographic Comparison of Respondents and Nonrespondents*

	%F Respondents	%F Nonrespondents	χ^2	df	P Value
Fantasy					
Males	93.5	6.5	9.42	1	NS
Females	92.6	7.4			
Lower SES	92.8	7.2	28.79	1	<.0001
Higher SES	94.3	5.7			
Metro	94.4	5.6	97.05	1	<.0001
Nonmetro	91.7	8.3			
Religious	93.3	6.7	14.59	1	.0001
Nonreligious	91.6	8.4			
White	93.3	6.7	31.35	1	<.0001
Nonwhite	89.9	10.1			
Attractions					
Males	94.1	5.9	20.99	1	<.0001
Females	95.2	4.8			
Lower SES	94.2	5.8	68.35	1	<.0001
Higher SES	96.2	3.8			
Metro	94.6	5.4	0.002	1	NS
Nonmetro	94.6	5.4			
Religious	94.9	5.1	32.65	1	<.0001
Nonreligious	92.7	7.3			
White	95.1	4.9	178.98	1	<.0001
Nonwhite	88.1	11.9			
Orientation					
Males	95.1	4.9	37.68	1	<.0001
Females	96.4	3.6			
Lower SES	95.2	4.8	63.86	1	<.0001
Higher SES	97.0	3.0			
Metro	95.8	4.2	0.49	1	NS
Nonmetro	95.7	4.3			
Religious	95.9	4.1	12.75	1	.0004
Nonreligious	94.7	5.3			
White	96.1	3.9	83.34	1	<.0001
Nonwhite	91.3	8.7			

* SES, socioeconomic status; Metro, metropolitan school; Nonmetro, nonmetropolitan school; NS, not significant.

spondents and more likely to be nonwhite, less religious, and of lower socioeconomic status. On various items, the mean age of respondents was 15 years and for nonrespondents, 14.1 to 14.4 years. Females were significantly more likely than males to respond to the sexual attraction (95.2% vs 94.1%) and orientation (96.4% vs 95.1%) items; but each gender was significantly less likely than the other to answer the question regarding sexual experience with partners of the same sex. Ethnic and geographic differences in sexual behavior could not be studied because of the deletion of questions in metropolitan schools, which had the greatest concentration of students of color.

Sexual Orientation Self-identification

Overall, 10.7% of students described themselves as being "unsure" of their sexual orientation; 88.2% as mostly or totally heterosexual; 0.7% as bisexual, and 0.4% as mostly or totally homosexual. Excluding persons who were unsure of their orientation, 98.7% of the remaining students described themselves as being predominantly heterosexual, 0.9% as bisexual, and 0.4% as predominantly homosexual.

Cross-tabulations of students' responses by demographic variables are presented in Table 3. The following is a summary of the statistically significant findings. The percentage of students who were "unsure" about orientation steadily declined with age from 25.9% in 12-year-old persons to 5% in 18-year-old students (see Fig 1). As indicated in Table 3 ("identity resolution"), persons who were "unsure" of their orientation were significantly younger and more likely to be male, nonwhite, and living in lower socioeconomic strata than others who identified themselves as heterosexual, homosexual, or bisexual. Compared with other subjects, "unsure" students were significantly less likely to report heterosexual experiences (37% vs 64%, χ^2 834.62, $df = 1$, $P < .0001$) and more likely to report bisexual attractions (3.2% vs 0.4%, χ^2 340.05, $df = 1$, $P < .0001$), as well as homosexual (1.1% vs 0.5%) or bisexual fantasies (7.2% vs 1.5%) (χ^2 42.22, $df = 2$, $P < .0001$).

Males were significantly more likely than females to label themselves as mostly or 100% homosexual, and they were less likely to adopt the heterosexual or bisexual descriptors. For males, but not females, religiosity was negatively associated with the reporting of a homosexual or bisexual orientation. Fifty-nine percent of homosexual and 23% of bisexual boys considered themselves to be "not at all" religious, compared with 17% of heterosexual boys (χ^2 197.97, $df = 2$, $P < .0001$).

The percentage of students reporting a predominantly ("mostly" or "100%") heterosexual orientation increased slightly with age from 98.4% at age 12 to 99.2% at 18 years of age, with a corresponding decline in the percentage who adopted the bisexual label. The percentage of students reporting a homosexual orientation remained at fairly constant low levels, ranging from 0.2% to 0.5% at different ages. The mean ages of students within the sexual orientation subcategories differed significantly from one another, the eldest being homosexuals (16 years), followed by heterosexuals (15.1 years), bisexuals (14.5 years), and persons who were unsure (14 years) (F ratio 28.61, $df = 2/29,589$, $P < .0001$, Scheffe test: each group different from the others).

Sexual Attractions/Behavioral Intent

The percentage of students reporting predominantly homosexual attractions steadily increased with age, while the proportion with bisexual or predominantly heterosexual attractions decreased (Fig 2). Primarily homosexual attractions were reported by 4.5% of the total sample and 6.4% of 18-year-old students. The mean age of persons reporting heterosexual attractions (15 years) was significantly different from

TABLE 3. Demographic Characteristics of Sexual Orientation Subcategories*

Identity Resolution	"Sure"	"Unsure"	χ^2	<i>df</i>	<i>P</i> Value	
Males	89.9	10.1	11.5	1	.0007	
Females	88.7	11.3				
Lower SES	86.3	13.7	458	1	<.0001	
Higher SES	93.5	6.5				
Metro	90.9	9.1	91.6	1	<.0001	
Nonmetro	87.7	12.3				
Religious	89.5	10.5	10.8	1	.001	
Nonreligious	87.7	12.3				
White	90.0	10.0	274.7	1	<.0001	
Nonwhite	77.6	22.4				
Orientation†	Hetero	Bi	Homosex	χ^2	<i>df</i>	<i>P</i> Value
Males	98.5	0.8	0.7	41	2	<.0001
Females	98.9	0.9	0.2			
Lower SES	98.6	1.1	0.3	18	2	.0001
Higher SES	99.1	0.6	0.3			
Metro	98.6	0.8	0.6	13	2	NS
Nonmetro	98.8	0.9	0.3			
Religious	99	0.8	0.2	208	2	<.0000
Nonreligious	96.6	1.5	2.0			
White	98.8	0.8	0.4	17	2	.0002
Nonwhite	97.7	1.2	1.1			
Attractions	Hetero	Bi	Homosex	χ^2	<i>df</i>	<i>P</i> Value
Males	95.5	0.8	3.7	52.6	2	<.0001
Females	94.3	0.5	5.2			
Lower SES	95.8	0.8	3.4	66.3	2	<.0001
Higher SES	94.4	0.4	5.2			
Metro	94.5	0.7	4.8	11.3	2	NS
Nonmetro	95.2	0.7	4.1			
Religious	95.1	0.6	4.3	38	2	<.0001
Nonreligious	92.9	1.2	5.9			
White	94.9	0.6	4.5	42.3	2	<.0001
Nonwhite	94.4	1.9	3.7			
Fantasy	Hetero	Bi	Homosex	χ^2	<i>df</i>	<i>P</i> Value
Males	97.8	1.7	0.5	30664	2	<.0001
Females	96.9	2.5	0.6			
Lower SES	97.6	1.9	0.5	0.26	2	NS
Upper SES	97.6	1.9	0.5			
Metro	97.2	2.2	0.6	3.81	2	NS
Nonmetro	97.5	2.0	0.5			
Religious	97.4	2.1	0.5	11.9	2	NS
Nonreligious	96.9	2.2	0.9			
White	97.6	1.9	0.5	116.4	2	<.0001
Nonwhite	93.4	5.4	1.2			

* SES, socioeconomic status; Metro, metropolitan school; Nonmetro, nonmetropolitan school; NS, not significant; Hetero, heterosexual; Bi, bisexual; Homosex, homosexual.

† Excluding "unsure" students.

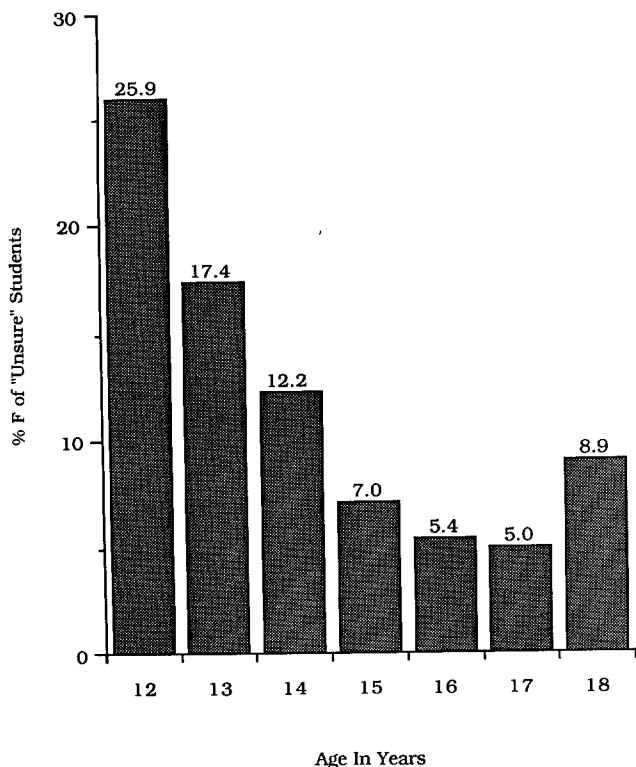


Fig 1. Age-specific prevalence (percent frequency (%F)) of uncertainty regarding sexual orientation.

that of others with bisexual (14.5 years) or predominantly homosexual attractions (15.6 years) (F ratio 84.87, $df = 2/32,746$, $P < .0001$; Scheffe procedure indicated significant difference between heterosexual vs homosexual or bisexual).

Gender differences were statistically significant, with females more likely than males to report homosexual attractions but less likely to have bisexual or predominantly heterosexual attractions. Male, but not female, students with bisexual and homosexual attractions were less likely than others to report religious feelings (22% vs 12%, $\chi^2 67.36$, $df = 2$, $P < .0001$). The correlation between sexual orientation labels and attractions was weak but statistically significant (Kendall $\tau .19$ for all students, $.10$ for females, $.29$ for males; $P < .0001$). Of the students who reported homosexual attractions, only 5.1% actually described themselves as predominantly homosexual.

As indicated in Table 3, there were statistically significant differences in the reporting of homosexual attractions between white and other ethnic subpopulations. Compared with white students (4.5%), homosexual attractions were reported more often by Hispanic (9.3%) and Asian/Pacific females (5.1%) and less often by Native American (2.6%) and black females (1.7%) ($\chi^2 131.22$, $df = 8$, $P < .0001$). The reporting of homosexual attractions rose with socioeconomic status (Fig 3). Compared with students with either homosexual or heterosexual attractions, a larger proportion of students reporting bisexual attractions were from lower socioeconomic strata (56 vs 44%, $\chi^2 66.34$, $df = 2$, $P < .0001$).

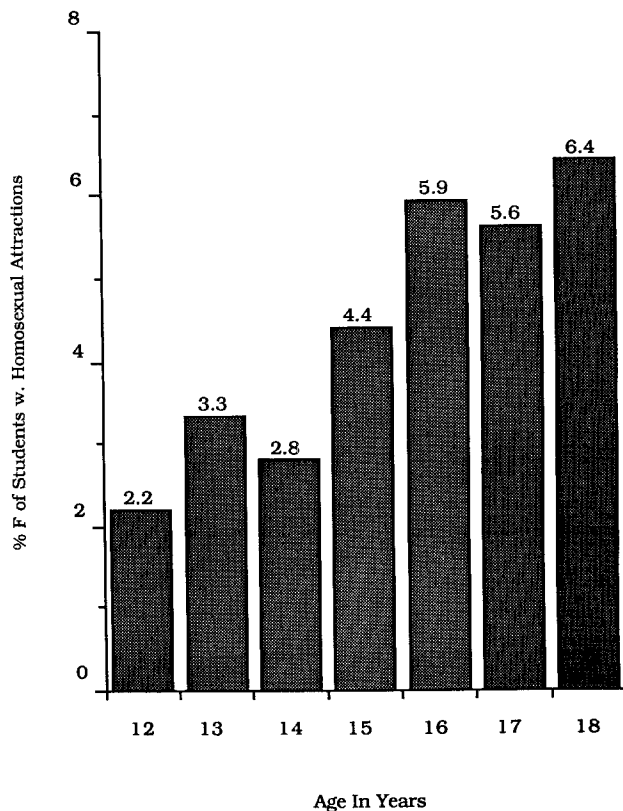


Fig 2. Age-specific prevalence (percent frequency (%F)) of predominantly homosexual attractions.

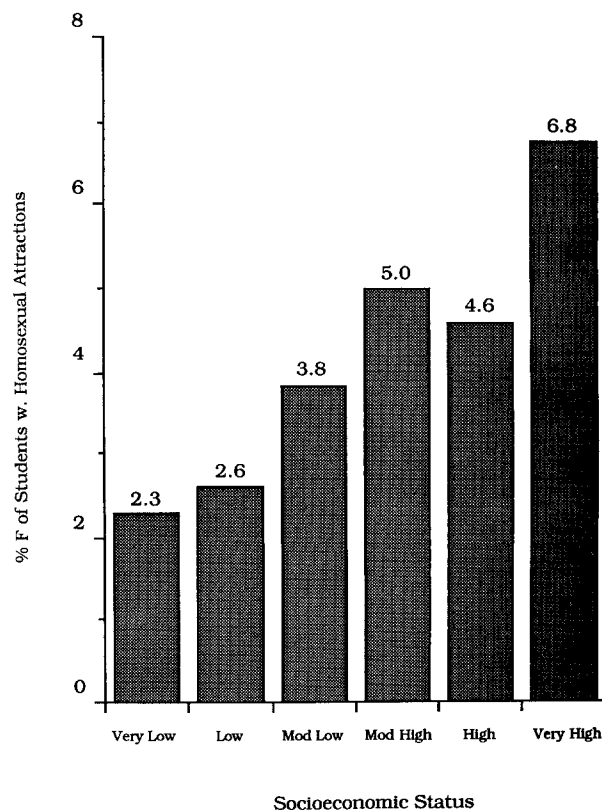


Fig 3. Prevalence (percent frequency (%F)) of homosexual attractions in relation of socioeconomic status.

Homosexual and Heterosexual Experience

Overall, 1% of respondents reported some homosexual experience; and 52%, some heterosexual experience. Students with homosexual experiences were also more likely than the other subjects (73% vs 61%, $\chi^2 19.67$, $df = 1$, $P < .0001$) to have had heterosexual experiences. Males were more likely than females to report homosexual activity (1.6% vs 0.9%, $\chi^2 27.02$, $df = 1$, $P < .0001$). For males, but not females, the prevalence of reported homosexual experience increased with age, from 0.4% at 12 years to a peak of 2.8% at age 18. Boys who did not report homosexual activity were significantly more likely to describe themselves as religious than the others (88% vs 74%, $\chi^2 41.04$, $df = 1$, $P < .0001$). For both genders, the prevalence of homosexual activity did not vary with socioeconomic status.

Only 27.1% of students with homosexual experiences actually identified themselves as homosexual or bisexual. Heterosexual experiences were reported with equal frequency (65%) by students who identified themselves as either heterosexual or homosexual (Fig 4). Bisexual students had significantly lower levels of heterosexual activity and more homosexual experiences than their heterosexual counterparts ($\chi^2 25.31$, $df = 2$, $P < .0001$).

Sexual Fantasies

Bisexual or homosexual fantasies were reported by 2.6% of all students. They were more frequently reported by girls than boys (3.1% vs 2.2%, $\chi^2 30.664$, $df = 2$, $P < .0001$). Students reporting homosexual fantasies were considerably more likely to describe a homosexual orientation (31.2%) than other youth

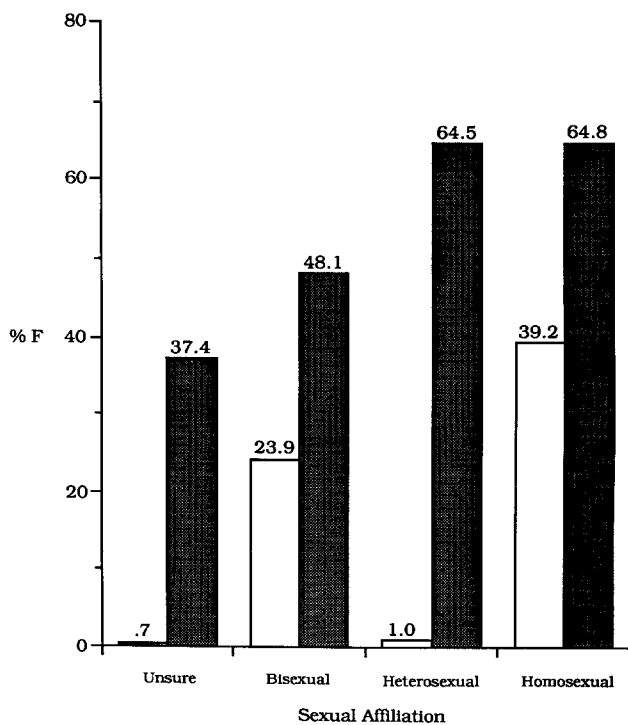


Fig 4. Prevalence (percent frequency (%F)) of homosexual and heterosexual experience in relation to sexual affiliation. Open bars indicate homosexual experience; shaded bars indicate heterosexual experience.

with heterosexual (0.2%) or bisexual (94%) fantasies ($\chi^2 5009$, $df = 4$, $P < .0001$). They were also more likely to have had homosexual experiences (35.3%) than the other students (0.8% for persons with heterosexual fantasies and 14.2% for those with bisexual fantasies) ($\chi^2 2079$, $df = 2$, $P < .0001$).

Students reporting bisexual fantasies were significantly younger (mean age 14.5 years) than those with exclusively heterosexual (mean 15 years) or homosexual (mean 15.1 years) fantasies (F ratio 30.39, $df = 2/31,946$, $P < .0001$); the Scheffe procedure indicated that the bisexual group differed significantly from homosexual or heterosexual groups). Although sexual fantasies did not vary with socioeconomic status and residence, ethnic differences among the males were significant, with bisexual/homosexual fantasies reported by 7.5% of Asian/Pacific, 4.5% of Native American, 4.1% of Hispanic, 2.8% of black, and 2% of white males ($\chi^2 59.67$, $df = 8$, $P < .0001$). Boys who did not report homosexual fantasies were more likely to regard themselves as religious than others (87% vs 69%, $\chi^2 25.04$, $df = 2$, $P < .0001$). Race and religiosity were not significantly associated with the direction of girls' sexual fantasies.

DISCUSSION

Sexual orientation has been defined as a consistent pattern of sexual arousal toward persons of the same and/or opposite gender,¹¹ encompassing fantasy, conscious attractions, emotional and romantic feelings, sexual behaviors, and possibly other components.^{9,10} Since the heterosexual or homosexual direction of the individual dimensions may be at variance with another, numerous permutations of orientation are possible and probable in human populations. As Kinsey et al⁵ remarked in their study of American men:

Males do not represent two distinct populations, heterosexual and homosexual. The world is not to be divided into sheep and goats. It is a fundamental of taxonomy that nature rarely deals with discrete categories. Only the human mind invents categories and tries to force facts into separated pigeonholes. The living world is a continuum in each and every one of its aspects. The sooner we learn this regarding human sexual behavior, the sooner we shall reach a sound understanding of the realities of sex.

Sexual orientation is widely believed to be determined during early childhood,¹² but its unfolding between childhood and adulthood is poorly understood. Until the mid-1980s, homosexuality was considered an adult phenomenon; and minors were thought to be uniformly heterosexual or undifferentiated. Youthful homosexual behavior was regarded as transient experimentation, typical of early adolescence. Recent studies involving adolescents with well-established homosexual identities, as well as the concentration of acquired immunodeficiency syndrome cases among adolescent gay men, have prompted a reevaluation of this perspective.¹³

A total of 1.4% of students in this study described themselves as bisexual or homosexual, and the actual prevalence of bisexuality/homosexuality may be even greater. The proportion of boys reporting primarily homosexual attractions and behavioral intent (6.4% by age 18) approximated the magnitude of Kinsey's projections of adult homosexuality. Older adolescents

were more likely than younger students to report homosexual identities, attractions, and behaviors, at odds with the concept of homosexuality as an early adolescent phenomenon.

Contrary to the data of Kinsey and coworkers^{5,6} and Sorenson,⁷ this study did not uncover marked differences in the male and female patterns of experiment orientation. Although homosexual identification was more common among males, the magnitude of the gender difference was small; and a larger proportion of young women than men reported homosexual attractions and fantasies. The absence of anticipated gender differences might be explained by a relatively greater reluctance among boys to endorse dimensions of homosexuality. Alternatively, homosexual boys may be more likely than young lesbians to drop out of school and not be counted in a school-based survey. Either possibility might obscure real gender differences in sexual orientation, but there are insufficient ancillary data to evaluate their likelihood.

It is also possible that presumed gender differences in the sexual orientation of adults are artifacts of sex role expectations. Compared to men, women may be more apt to experience same-sex attachments without lesbian identification.¹⁴ Conversely, because of more rigid male gender roles, men may be more likely to view same-sex attractions as outside the realm of heterosexuality. Thus, gender differences in the prevalence of self-reported homosexuality among adults may be a function of social norms, rather than actual differences in attractions, fantasies, and behaviors.

The observed relationship between sexuality and religiosity, ethnicity, and socioeconomic status provided further evidence of social influences on perceived sexual identity. For boys only, religiosity was negatively associated with all dimensions of homosexuality, consistent with the exclusively male focus of biblical proscriptions.¹⁵ The reporting of homosexual attractions among boys and girls rose steadily with socioeconomic status, reflecting parental education level and, perhaps, tolerance for sexual diversity.¹⁶ Finally, the significant ethnic differences in the prevalence of reported homosexual fantasies and attractions also may be related to divergent cultural norms.

Despite the diversity in reported attractions and fantasies, there were uniformly low levels of homosexual identification among all ethnic and socioeconomic subpopulations. Less than one third of all subjects with predominantly homosexual fantasies, attractions, and/or behaviors actually described themselves as bisexual or homosexual. The discordance between affiliation and other dimensions of sexuality was not readily attributable to a misunderstanding of the questions, since the proportion of students identified as gay, lesbian, or bisexual was consistently small across all age and grade levels, ethnic groups, and geographic areas (where reading ability and sexual vocabulary might vary). Moreover, the sexual affiliation item response rate (95.7%) was excellent; and the percentage of 18-year-old male students reporting homosexual behavior (2.8%) was comparable with figures reported by Sonenstein et al⁸

(3%) and investigators from the National Opinion Research Center¹⁷ (3.2%).

The discrepancy between adolescents' reported sexual orientation and their attractions, fantasies, and behaviors may reflect a reluctance to be labeled as homosexual. Students were most likely to endorse same-sex attractions, followed by fantasies and experiences, and they were least likely to describe themselves as homosexual. The sexual orientation item was the only question to use, what might be considered, stigmatizing terms: "homosexual, bisexual, gay and lesbian." An element of defensiveness also was suggested by gender-specific differences in response rates to items pertaining to homosexual behavior. Boys were more likely than girls to skip the question about sex with males; and girls were less likely to answer about sex with females.

IMPLICATIONS

Although longitudinal developmental change cannot be imputed from cross-sectional data of this type, the finding suggested an evolution of sexual perceptions, from early adolescent uncertainty to the resolution of identity during young adulthood. The percentage of students who were "unsure" about their orientation steadily declined with age from 25.9% in 12-year-old persons to 5% in 18-year-old students. Youth who were "unsure" were more likely than others to entertain homosexual fantasies and attractions and less likely to have had heterosexual sexual experiences.

Compared with the unsure student, "bisexual" youth were somewhat older, less religious, and more likely to have had homosexual relations. The percentage of students adopting an unsure or bisexual label diminished with age, as the proportion of students identified as heterosexual increased. Overall, the mean age and prevalence of heterosexual experience among "heterosexuals" were greater than those of "bisexual" or "unsure" students. The mean age and level of homosexual experience among "homosexual" youth were greater than those of the others, although "heterosexual" and "homosexual" students reported heterosexual behavior with equal frequency (65%).

Taken together, these data suggest that uncertainty about sexual orientation and perceptions of bisexuality gradually give way to heterosexual or homosexual identification with the passage of time and/or with increasing sexual experience. In the process, there is a distinct trend toward heterosexual identification. Only a minority of youth with homosexual fantasies, attractions, or behaviors report a homosexual identity during adolescence. Most often they are males in the upper adolescent age range who are sexually experienced with both genders and not constrained by their religious beliefs. Proof of this theory will require prospective, longitudinal studies involving large samples of adolescents. Both qualitative and quantitative research strategies are needed to understand maturational, gender, and historical effects on evolving perceptions of sexual orientation.

Ultimately, the findings illustrate the complexities and difficulties in assigning sexual orientation labels to adolescents. Adolescents' own perceptions of their

sexuality may not conform to adult standards. Classification of youths' sexual orientation by sexual behavior, or any other single aspect of sexuality, may be unreliable. Incongruities between attractions, fantasies, behaviors, and perceived sexual identities should be anticipated in research and clinical settings. Nonetheless, sexual education, human immunodeficiency virus risk reduction, and clinical services for adolescents should not assume that their audiences are exclusively heterosexual, since some teenagers do endorse homosexual attractions and behavioral intent and many others have uncertainties about the direction of their sexual feelings. To date, this survey represents the largest population-based study of human sexual orientation and the most comprehensive picture of adolescents' orientation; but considerable work remains to decipher the development of sexual identity from childhood to adulthood.

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