

Sexual Initiation Patterns of U.S. Sexual Minority Youth: A Latent Class Analysis

CONTEXT: The typical understanding of sexual debut as first vaginal intercourse is often irrelevant to sexual minority youth. Better understanding of sexual initiation patterns among these youth is necessary to inform efforts to safeguard their sexual and reproductive health.

METHODS: Early sexual experiences were examined among 1,628 female and 526 male sexual minority participants in Waves 1 (1994–1995) and 4 (2008) of the National Longitudinal Study of Adolescent to Adult Health. Latent class analyses identified initiation patterns distinguished by the timing, sequence and spacing of first experiences of sexual behaviors. Multinomial logistic regression analyses assessed correlates of various patterns.

RESULTS: Initiation classes for females were categorized as typical debut (representing 41% of the sample, characterized by vaginal intercourse and short spacing between first two behaviors); dual behavior debut (35%, characterized by vaginal and oral sex in the same year); early sexual debut (17%, characterized by average debut at 13, vaginal intercourse, and anal sex before 18); and delayed debut with oral sex (6%). Male classes were single behavior (50%, characterized by oral sex and longer spacing); multiple behavior (32%, characterized by vaginal and oral sex); early anal sex (11%, characterized by anal intercourse before 18); and very early debut (6%, characterized by oral sex and average debut at 10). Class membership was associated with socioeconomic status for females; age and sexual victimization for males; and race, ethnicity and religiosity for both.

CONCLUSIONS: Initiation patterns of sexual minority youth differ between genders and involve noncoital behaviors and characteristics beyond timing.

Perspectives on Sexual and Reproductive Health, 2017, 49(1):55–67, doi: 10.1363/psrh.12020

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Throughout the sexual health literature, the indicator “age at sexual debut”—typically defined as age at first vaginal intercourse—has been used to link sexual and reproductive health outcomes in young adulthood to early sexual experience and sexual risk. A review of 65 studies found that earlier first vaginal intercourse was associated with numerous lifetime risky sexual practices and outcomes, including having a greater number of sexual partners, having concurrent partners, engaging in transactional sex and receiving an STD diagnosis.¹ Life course theory holds that adult attitudes, beliefs and behaviors—including health behaviors—are determined not just by concurrent exposures, but by the accumulation of experiences across one’s lifetime and by the timing and contexts of personally and developmentally significant milestones and transitions.^{2,3} Because sexual debut is often considered a critical “life transition” event, the timing of first vaginal intercourse is theorized to have substantial implications for when and how the rest of one’s sexual history and development unfold.^{1,4}

For lesbian, gay and bisexual youth, however, penile-vaginal intercourse may not be particularly relevant to sexual development. Though vaginal intercourse is common among sexual minority adolescents,^{5,6} evidence from qualitative research suggests that its emotional salience may differ for sexual minority and heterosexual individu-

als. In various studies, sexual minority respondents were more likely than heterosexual peers to think of nonvaginal intercourse (e.g., oral-genital contact) as sex;⁷ identify a noncoital encounter as their own loss of virginity;⁸ and view first vaginal intercourse as just one stage in their overall sexual development, rather than as an emotionally meaningful “gift” given to a partner.⁸ Participants in one focus group of 18 sexual minority adults spoke of multiple virginity losses, distinguishing between first same-sex and other-sex encounters; they also noted that the typical rhetoric regarding virginity (and its emphasis on heterosexual coitus) made the concept difficult to define for, if not explicitly irrelevant to, sexual minority populations.⁹

Determinants of sexual initiation (and early sexual risk) may also differ by sexual orientation. One systematic review noted that adolescents who reported greater religiosity typically experienced first vaginal intercourse at an older age, or were likely to remain virgins longer, than their less religious peers,¹⁰ yet among sexual minority populations, religiosity has been associated with increased sexual risk.^{11–13} Sexual minority youth have also reported increased prevalence of characteristics and experiences associated with both earlier sexual initiation and risky behavior at first sex, including contraceptive nonuse, sex while intoxicated and sexual victimization.^{14–17} Given

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that differences in sexual risk and sexual risk factors exist according to sexual orientation, measures and models of adolescent sexual initiation that are specific to sexual minorities' experience are needed.

A narrow definition of sexual debut as the experience of vaginal intercourse ignores the fact that adolescent sexual experience often includes oral sex and, to a lesser extent, anal sex, and that the timing and contexts of these behaviors may be important for later sexual health. An alternate approach, informed by life course theory, is to conceptualize sexual debut as a succession of events that, together, are important for sexual development and trajectories. Both the sequence and the spacing of initiation behaviors may, independently and jointly, have important implications for sexual and reproductive health. Different initiation sequences may reflect individual differences (e.g., in levels of sensation seeking or erotophilia) or contextual differences (e.g., in availability of partners or in social and peer norms regarding sexuality and sexual orientation), which could intersect with timing in important ways. From a developmental perspective, for example, closer spacing of first experiences of different types could signal earlier pubertal timing, which has been linked with earlier vaginal initiation and multiple and riskier sexual behaviors during adolescence, possibly because individuals who physically develop earlier may not possess the emotional maturity necessary to successfully negotiate sexual and romantic relationships, or may lack access to peers of similar age and similar physical development.¹⁸

A number of studies have adopted this broader interpretation and explored how the sequence and timing of multiple behaviors are associated with later sexual and reproductive health. Reese and colleagues¹⁹ found that among heterosexual female respondents in the National Longitudinal Study of Adolescent to Adult Health (Add Health), teenage pregnancy risk differed according to the first behavior initiated: Females who initiated with oral sex, or with multiple behaviors in the same year, were less likely to experience a teenage pregnancy than were those who initiated with vaginal intercourse. Using the same data set, Haydon and colleagues conducted a latent class analysis to derive patterns of sexual initiation among a sample of exclusively heterosexual respondents; they incorporated information on age at first oral, anal and vaginal sex, as well as on the timing, sequence and spacing of these behaviors.²⁰ Respondents were assigned to one of five classes, each reflecting a distinct sexual initiation pattern. Numerous differences emerged in the characteristics and sexual and reproductive health outcomes associated with class membership. For example, respondents in the "postponers" class (defined partly by oldest age at debut of any behavior) reported better parental relationships in adolescence than did respondents in all other classes, and were less likely than individuals in the "vaginal initiators/multiple behaviors" class (the largest one) to have received

an STD diagnosis or to have reported recent concurrent partners.^{21,22}

Though these findings suggest that new approaches to measuring sexual initiation may be necessary, because Haydon and colleagues' sexual initiation classes were constructed using a heterosexual sample, the utility of the resultant patterns for sexual minority-focused analyses remains unclear. While there is some understanding of typical sexual behavior timelines for heterosexual youth,^{23,24} virtually nothing is known about what is typical or relevant for sexual minority youth. Preliminary evidence suggests that differences in initiation patterns may exist between sexual minorities and heterosexuals. For example, a California study of sexually active female high school students found that sexual minorities were more likely than exclusively heterosexual individuals to have engaged in oral and anal sex, but were less likely to have had heterosexual vaginal intercourse.²⁵ In a study of gay and bisexual males aged 15–22 living in Chicago and Miami, respondents were more likely to have engaged in oral or anal sex with a male partner than in vaginal intercourse with a female partner.²⁶ However, because studies to date have relied largely on small, nonrepresentative, single-sex samples, it is difficult to draw conclusions. The dimensions used in the Haydon et al. class construction (timing, sequence, spacing) would likely capture the behavioral complexity that is often missed in analyses of sexual minority youth, particularly if employed in a representative sample.

A related limitation of analyses of sexual initiation among sexual minority youth has been the lack of exploration of within-group differences by characteristics such as race, ethnicity and socioeconomic status. Understanding such differences in sexual initiation patterns may be critical to understanding disparities in sexual and reproductive health later in life. For example, race and ethnicity have been found to be strongly associated with the stressors that sexual minority youth encounter: Compared with their white peers, adolescents of color have reported higher rates of bullying, skipping school because of safety concerns and suicidal ideation,²⁷ as well as higher rates of STDs in young adulthood.²⁸ Improved knowledge of the intersecting relationships between demographic and contextual characteristics and sexual initiation may elucidate potential points of intervention, and improve our understanding of the relationships between social variables and sexual and reproductive health in adulthood.

Using data from Add Health, the present study addresses these gaps by replicating the sexual initiation latent class analysis conducted by Haydon and colleagues among an exclusively sexual minority population, stratified by biological sex. It also explores sociodemographic differences among the resulting classes. We believe this is the first study to present a model of sexual initiation specific to lesbian, gay and bisexual adolescents, and possibly the first to utilize a racially and socioeconomically diverse, nationally representative sample to explore differences both between males and females and within each sex.

METHODS

Sample

Add Health is an ongoing prospective study of a nationally representative probability sample of 20,745 adolescents who were in grades 7–12 during the 1994–1995 school year. To date, four waves of in-home interviews have been completed, most recently with 15,170 respondents in 2008, when they were aged 24–32. Detailed information on the Add Health study design is reported elsewhere.²⁹

Inclusion in the present analysis was limited to participants categorized as a sexual minority (on the basis of their responses to relevant measures) who had had oral, anal or vaginal sex as of Wave 4; had participated in Waves 1 and 4; had valid sampling weights; and were not missing data on any sexual initiation or model covariates.

Measures

•**Sexual orientation.** Three measures of sexual orientation were used: sexual identity, lifetime partners and partners before age 18. Following approaches employed elsewhere,^{30–32} we classified respondents as a sexual minority if they had ever had a same-sex partner by the Wave 4 interview or if, in response to the item “Choose the description that best fits how you think about yourself,” they selected “mostly heterosexual,” “bisexual,” “mostly homosexual” or “100% homosexual.” Some 390 respondents who identified as 100% heterosexual but reported a previous same-sex partner, as well as six respondents who provided a sexual minority response on one indicator but did not complete the other indicator, were also included in the sample. The second measure—lifetime sexual partners—was constructed from respondents’ Wave 4 reports of the numbers of male and female partners (“considering all types of sexual activity”) they had had in their lifetime, and was categorized as other-sex partners only, same-sex and other-sex partners, or same-sex partners only. The third measure was based on Wave 4 reports of the numbers of male and female partners respondents had had before age 18; the resulting categories were the same as for lifetime partners, with the addition of “none.”

•**Sexual initiation.** Indicators of sexual initiation, constructed using reports from Wave 4 interviews, replicated those used by Haydon et al.²⁰ in their heterosexual sample, allowing for comparisons of initiation patterns across sexual orientation.

In separate questions, respondents were asked if they had ever had vaginal intercourse (“when a man inserts his penis into a woman’s vagina”), oral sex (“when a partner puts his/her mouth on your sex organs or you put your mouth on his/her sex organs”) or anal intercourse (“when a man inserts his penis into his partner’s anus or butt hole”). If they answered in the affirmative, they were asked their age at “the very first time” for each behavior. From these answers, five indicators were constructed. The number of types of sexual behaviors was based on respondents’ reports of having ever engaged in the behaviors (range, 1–3). Age at first sexual behavior reflects the initiation

age at the earliest assessed behavior (range, 10–29; ages of nine or younger were coded as 10). Experience of anal sex before age 18 was a dichotomous variable. The measure of years between first and second behaviors was categorized as one, two, 3–5, or six or more, “single lifetime behavior” or “multiple behaviors in same year.” Finally, a respondent’s first sexual behavior represented the earliest one reported, and for parsimony, five categories were constructed: vaginal intercourse only; oral sex only; vaginal intercourse and oral sex in the same year; anal intercourse without vaginal intercourse (may include oral sex in the same year); and anal intercourse and vaginal intercourse in the same year (with or without oral sex). The last two categories were included to reflect common patterns seen in the sexual minority sample.

•**Social and demographic variables.** Because some research has demonstrated strong associations between the timing of sexual debut and adolescent sexual risk,^{33,34} several social and demographic characteristics, measured at Wave 1 unless otherwise indicated, were included as covariates of sexual initiation. Respondents’ race and ethnicity were categorized as Hispanic, black, Asian or Pacific Islander, or white.* Age at Wave 4 was classified as 24–26, 27–29 or 30–34. Parental education level, used as a proxy for Wave 1 socioeconomic status, was defined as the highest level obtained by at least one parent or guardian; categories were less than high school, high school or GED, some college or post-high school education, and college or higher. The measure of neighborhood poverty reflected the proportion of families in a respondent’s census block group with dependents younger than 18 and income below the federal poverty level in 1989; proportions were categorized as low (less than 11.6%), medium (11.6–23.9%) or high (more than 23.9%).³⁵

Because sexual orientation may moderate the association between religiosity and sexual initiation,¹² two measures of religiosity were included. Past-year public religious participation was constructed by summing responses to two measures: frequency of attending religious services and frequency of participating in religious youth activities (standardized Cronbach’s alpha, 0.77). Response options ranged from “never” to “once a week”; the possible score range was 0–6. Private religiosity was constructed by summing responses to items on importance of religion (using a four-point Likert scale that ranged from “not important at all” to “very important”) and frequency of prayer (using a five-point scale from “never” to “once a day”). The standardized Cronbach’s alpha for these items was 0.86; possible scores ranged from 0 to 7. For both religiosity measures, higher scores indicated stronger religiosity.

Several Wave 4 measures of sexual victimization prior to sexual debut were included to examine the relationship

*Thirty-four respondents who identified themselves at Wave 1 as American Indian or Native American, or said they were of other racial background, were reassigned to one of the four listed categories when race and ethnicity were reassessed at Wave 3.

between victimization and debut, and to control for non-consensual initiation experiences. Childhood sexual abuse reflected encounters perpetrated by a parent or guardian before age 18 (“touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations”). Two measures reflected encounters perpetrated by an individual who was neither a parent nor a caregiver: physically forced sex (“forced physically to have any type of sexual activity against your will”) and coerced sex (“forced non-physically”). These two variables were treated separately because preliminary analyses found prevalence differences in these encounters by biological sex. Finally, we included a measure of any sexual victimization.

Analysis

To develop a more thorough measure of sexual initiation, we used the person-centered approach of latent class analysis. In such an analysis, multiple observable variables (or indicators) are used to capture a single unobservable (latent) construct, and respondents who are highly similar to each other, but highly distinct from other respondents on indicator variables, are grouped together in a class.³⁶

After the sexual minority sample was identified, sexual initiation variables were constructed using STATA version 13.0,³⁷ and descriptive bivariate analyses (chi-square tests for categorical variables and F tests for continuous ones) were conducted to examine differences in measures of sexual orientation and initiation by biological sex. Initiation indicators were then output to Latent Gold, a specialized latent class software package, which was selected for its ability to handle survey weights and categorical and continuous variables, and for its ease of use.³⁸ Parallel solutions ranging from one to nine classes were fit and compared for males and females separately; survey weights were incorporated to adjust for the complex Add Health survey design, and 250 iterations and 250 start values were used to improve model fit. No a priori hypotheses were made about the number or structure of the resulting classes. Determination of the final number of classes was based on the interpretability of solutions, the size of resultant classes, violations of local independence and goodness of fit statistics, consisting of Bayesian information criteria, Akaike information criteria, consistent Akaike information criteria and entropy (lower values for the three criteria and higher entropy indicate better fit).³⁹

Once the solution was selected, respondents were assigned to the class for which their posterior probability of membership was highest, and class membership assignment was output to STATA for subsequent analyses. Descriptive bivariate analyses were conducted to explore within-class distributions of social and demographic characteristics by sexual initiation, as well as to test for differences between classes (within each sex). Finally, multinomial logistic regression analyses were used to assess whether social and demographic variables were associated with class membership.

RESULTS

Sample Characteristics

A total of 2,154 sexual minority respondents were included in the analysis, of whom three-fourths were female. The majority were white, were aged 27–29, had at least one parent or guardian with at least some education beyond high school, and had grown up in a neighborhood in which relatively few households had incomes below the federal poverty level (Table 1). On average, respondents reported moderate levels of public and private religiosity. One in 10 respondents had experienced childhood sexual abuse, been physically forced to have sex or been coerced to do so, and two in 10 reported any of these encounters.

Significant differences by biological sex were seen in all three sexual orientation variables. Notably, a greater proportion of females than of males identified as mostly heterosexual

TABLE 1. Selected characteristics of sexual minority respondents surveyed at Waves 1 (1994–1995) and 4 (2008) of the National Longitudinal Study of Adolescent to Adult Health, by biological sex

Characteristic	Total (N=2,154)	Females (N=1,628)	Males (N=526)
PERCENTAGE DISTRIBUTIONS			
Race/ethnicity			
Hispanic	12.8	11.8	15.6
Black	11.7	11.6	11.9
Asian/Pacific Islander	3.3	3.4	2.8
White	72.3	73.3	69.7
Age			
24–26	22.6	25.1	15.8
27–29	52.7	53.7	50.0
30–34	24.7	21.2	34.3
Parental education level			
<high school	11.5	11.0	12.6
High school/GED	25.4	26.5	22.3
Some college/other	29.7	30.8	26.7
≥college	33.5	31.7	38.3
Neighborhood poverty†			
Low	57.2	56.9	58.0
Medium	21.5	22.3	19.3
High	21.3	20.8	22.8
Total	100.0	100.0	100.0
MEANS			
Religiosity			
Public (range, 0–6)‡	2.5	2.5	2.6
Private (range, 0–7)§	4.3	4.4	4.1
PERCENTAGES			
Sexual victimization prior to debut			
Childhood sexual abuse	10.0	11.0	7.1
Physically forced sex	8.7	9.9	5.6
Coerced sex	13.0	15.4	6.4
Any	21.0	23.8	13.0

†Neighborhood poverty reflects the proportion of families in a respondent's census block group with dependents younger than 18 and income below the federal poverty level in 1989. “Low” indicates that fewer than 11.6% were below the poverty line; “medium,” 11.6–23.9%; and “high,” more than 23.9%. ‡Reflects frequency of religious service attendance and participation in religious youth activities. §Reflects importance of religion and frequency of prayer. Notes: All variables except age and sexual victimization prior to debut were measured at Wave 1. Data are weighted to reflect Add Health's complex sampling design. Percentages may not add to 100.0 because of rounding or weighting.

(66% vs. 41%—Table 2), while a smaller proportion of females than of males said they were 100% homosexual (4% vs. 22%). Females were more likely than males to have had only other-sex partners (41% vs. 28%) and both other-sex and same-sex partners (58% vs. 53%), and were less likely to have had only same-sex ones (2% vs. 19%). Similarly, females were more likely to have had only other-sex partners prior to age 18 (66% vs. 35%), and far less likely to have had only same-sex partners before that age (2% vs. 16%).

All of the sexual initiation measures also showed significant differences by sex. On average, females reported having engaged in more types of sexual behaviors than males (means, 2.6 vs. 2.4), and their average age at first sexual behavior was about half a year younger (15.5 vs. 16.2). Compared with females, males were more likely to have had anal sex before turning 18 (20% vs. 11%) and to have engaged in only a single behavior over their lifetimes (8% vs. 4%). Overall, 33% of respondents initiated sexual behavior exclusively with vaginal intercourse (41%

of females and 12% of males), and 25% exclusively with oral sex (18% and 43%, respectively). Thirty-five percent initiated with vaginal intercourse and oral sex in the same year (37% and 30%, respectively). Only 3% of respondents initiated with anal intercourse (with or without oral sex in the same year), and 4% initiated with anal and vaginal intercourse within a year. Overall, 28% of individuals said their first experience consisted of a behavior other than vaginal intercourse.

Patterns of Sexual Initiation

Following comparison of the solutions for 1–9 classes (Supplemental Information), fit statistics indicated that either a four- or a five-class solution was the best fit for both males and females. For females, the five-class solution produced a class that was indistinguishable from others; for males, the five-class solution produced two classes with small cell sizes (less than 40). Therefore, a four-class solution was selected for both. Local independence violations were considered by examining bivariate residuals between each of the indicators; residuals greater than 1.0 were considered to be indicative of a violation. Two indicator pairs were above this threshold for females (first sexual behavior and anal sex prior to age 18; years between first and second behaviors and the anal sex measure). To account for this violation, we fit a local dependent model, conditioning on first the former pair, which had the larger bivariate residual of the two, then on the second pair, until no further residual violations were noted. For males, one indicator pair was above this threshold (years between first two behaviors and the anal sex measure); conditioning on this pair resulted in no further violations. The four-class, local dependent solutions explained 84% of the variance in sexual initiation indicators for females and 97% for males; they also produced low classification errors for both (8% and 1%, respectively). Therefore, these solutions were selected.

Because respondents were assigned to the class for which they had the highest probability of membership, there was some within-class variability in sexual initiation patterns (Table 3); labels for each class are based on the modal distribution for the class. In addition, though not used to define the initiation classes, differences in sexual identity and partner history were seen across classes (Table 4).

•**Females.** For females, the largest class, “typical debut” (comprising 41% of the sample), was characterized by an initiation pattern similar to that of the entire female sample (e.g., age at first sexual behavior was close to the average for all females—15.3 vs. 15.5). Females in this class reported the shortest interval between their first and second sexual behaviors (69% reported 1–2 years), and a majority initiated with vaginal intercourse only (58%), though 15% debuted with multiple behaviors. Females in the typical debut class were more likely than individuals in the dual behavior group (see below) to have had both same-sex and other-sex partners prior to turning age 18 (17% vs. 11%).

The second-largest class, comprising 35% of the sample, consisted of females who initiated with multiple behaviors;

TABLE 2. Selected characteristics reflecting respondents' sexual orientation and pattern of sexual initiation, by biological sex

Characteristic	Total	Females	Males
SEXUAL ORIENTATION			
Sexual identity***			
100% heterosexual†	18.3	17.1	21.7
Mostly heterosexual	59.7	66.3	41.4
Bisexual	9.1	9.6	7.8
Mostly homosexual	4.4	3.4	7.3
100% homosexual	8.5	3.6	22.0
Lifetime sexual partners***			
Other-sex only	37.3	40.8	27.8
Same-sex and other-sex	56.3	57.5	52.9
Same-sex only	6.4	1.7	19.3
Sexual partners before age 18***			
None	20.9	17.7	29.8
Other-sex only	57.6	65.7	35.1
Same-sex and other-sex	15.7	14.5	19.3
Same-sex only	5.8	2.1	15.9
SEXUAL INITIATION			
Mean no. of types of sexual behaviors***	2.56	2.61	2.40
Mean age at first sexual behavior*	15.67	15.49	16.17
Anal intercourse before age 18***	13.4	11.0	20.2
Years between first two sexual behaviors*			
Multiple behaviors in same year	41.3	40.9	42.4
1	19.8	19.9	19.6
2	12.6	13.5	9.9
3–5	14.5	15.3	12.2
≥6	7.1	6.8	8.2
Single lifetime behavior	4.6	3.5	7.8
First sexual behavior***			
Vaginal intercourse only	32.9	40.7	11.7
Oral sex only	24.8	18.2	43.1
Vaginal intercourse and oral sex‡	35.1	36.8	30.3
Anal intercourse, no vaginal‡	3.4	0.3	12.0
Anal and vaginal intercourse‡	3.8	4.1	2.9

* $p < .05$. *** $p < .001$. †Includes six respondents who identified as 100% heterosexual, but reported same-sex partners. ‡Behaviors occurred in the same year; anal intercourse categories may include oral sex. Notes: Data are weighted to reflect Add Health's complex sampling design. Figures are percentages unless otherwise noted. Percentages may not add to 100.0 because of rounding or weighting.

TABLE 3. Selected characteristics reflecting respondents' pattern of sexual initiation, by sexual debut class, according to biological sex

Characteristic	Debut class			
	Typical (N=655)	Dual behavior (N=564)	Early (N=293)	Delayed with oral sex (N=116)
FEMALES				
Mean no. of types of sexual behaviors	2.7	2.6	2.8	1.6
Mean age at first sexual behavior	15.3	16.4	13.3	18.1
Anal intercourse before age 18	14.8	0.0	27.9	0.0
Years between first two sexual behaviors				
Multiple behaviors in same year	14.8	100.0	0.0	0.0
1	40.8	0.0	14.6	8.1
2	28.4	0.0	7.6	7.7
3–5	11.3	0.0	56.5	12.0
≥6	4.6	0.0	21.3	17.7
Single lifetime behavior	0.0	0.0	0.0	54.6
First sexual behavior				
Vaginal intercourse only	58.1	0.0	87.8	20.2
Oral sex only	27.1	0.0	11.1	79.8
Vaginal intercourse and oral sex†	8.4	95.8	0.0	0.0
Anal intercourse, no vaginal†	<0.1‡	<0.1‡	1.1	<0.1‡
Anal and vaginal intercourse†	6.3	4.2	0.0	0.0
MALES				
	Single behavior (N=273)	Multiple behavior (N=169)	Early anal sex (N=52)	Very early (N=32)
Mean no. of types of sexual behaviors	2.3	2.5	2.6	2.8
Mean age at first sexual behavior	16.3	17.9	14.0	10.0
Anal intercourse before age 18	11.0	0.0	100.0	56.9
Years between first two sexual behaviors				
Multiple behaviors in same year	0.0	99.8	91.2	0.0
1	37.1	0.0	3.6‡	8.2‡
2	19.0	0.0	0.0	4.8‡
3–5	23.0	0.0	2.3‡	5.9‡
≥6	6.7	<0.1‡	0.0	76.4
Single lifetime behavior	14.2	0.0	3.0‡	4.7‡
First sexual behavior				
Vaginal intercourse only	23.0	0.0	0.0	1.0‡
Oral sex only	75.7	0.0	0.0	80.8
Vaginal intercourse and oral sex†	0.0	81.6	35.1	0.0
Anal intercourse, no vaginal†	1.3‡	12.6	55.5	18.2
Anal and vaginal intercourse†	0.0	5.8	9.4	0.0

†Behaviors occurred in the same year; anal intercourse categories may include oral sex. ‡N≤3. Notes: Data are weighted to reflect Add Health's complex sampling design; all Ns are unweighted counts. Figures are percentages unless otherwise noted. Percentages may not add to 100.0 because of rounding or weighting.

96% of those in this “dual behavior” class had vaginal intercourse and oral sex in the same year. Most individuals in this group selected a sexual identity other than 100% heterosexual (85%); the majority (72%) of members identified as mostly heterosexual. Females in this class were the most likely to have had only other-sex partners (48%).

Females classified in the “early debut” group (17%) reported the youngest average age at first sexual behavior (13.3) and the longest spacing between first and second behaviors (57% waited 3–5 years, and 21% waited six or more). Nearly all respondents in this class initiated exclusively with vaginal intercourse or oral sex (88% and 11%, respectively). Twenty-eight percent had engaged in anal intercourse before age 18. Sixty-seven percent of females in this class had had both same-sex and other-sex partners, though 84% reported only male partners before age 18.

The smallest class, comprising 6% of the sample, consisted of females who reported the oldest average age at sexual debut (18.1); individuals in this “delayed debut

with oral sex” class were the most likely to have initiated with oral sex only (80%), and 55% reported a single lifetime sexual behavior. Of the four classes, this one had a relatively high proportion of members who identified as bisexual (18%), and the highest proportions who were mostly homosexual (14%) and 100% homosexual (22%). In addition, females in this class were the most likely to report having had exclusively same-sex partners across their lifetimes and prior to age 18 (27% and 16%, respectively).

•**Males.** Initiation classes for males were similar to those for females, though the behaviors that defined each class, and the relative size of each class, differed. The largest class, comprising 50% of the sample, consisted of males who reported a single behavior at sexual initiation. However, whereas the majority of females in the typical debut class initiated with vaginal intercourse only, the majority of males in the “single behavior” class initiated with oral sex only (76%), and 23% initiated with vaginal intercourse only. Furthermore, males in this class reported an average age

TABLE 4. Selected characteristics reflecting respondents' sexual orientation, by sexual debut class, according to biological sex

Characteristic	Debut class			
FEMALES				
	Typical	Dual behavior	Early	Delayed with oral sex
Sexual identity***				
100% heterosexual	18.7	15.3	19.5	10.7#,††
Mostly heterosexual	66.4	72.2‡	65.5	35.4‡,§,††
Bisexual	11.0	7.0‡	8.5	17.9‡,††
Mostly homosexual	2.0	3.6	2.4	13.9‡,§,††
100% homosexual	1.9	1.9	4.1	22.1‡,§,††
Lifetime sexual partners***				
Other-sex only	39.2	48.4‡	33.3§	29.9§
Same-sex and other-sex	60.8	51.6‡	66.7§	43.4‡,††
Same-sex only	0.0	0.0	0.0	26.7‡,§,††
Sexual partners before age 18***				
None	10.9	27.9‡	0.3‡,§,‡‡	53.5‡,§,††
Other-sex only	69.8	60.5‡	83.7‡,§	19.2‡,§,††
Same-sex and other-sex	17.4	10.9‡	16.0	11.1
Same-sex only	2.0	0.8	<0.01‡,‡‡	16.2‡,§,††
MALES				
	Single behavior	Multiple behavior	Early anal sex	Very early
Sexual identity*				
100% heterosexual	23.3	19.4	12.0‡	38.3††
Mostly heterosexual	38.8	51.9‡	28.7§	29.7§
Bisexual	5.6	7.2	16.8	8.7‡‡
Mostly homosexual	6.3	8.1	6.9‡‡	12.2
100% homosexual	25.9	13.4	35.6§	11.2‡,††,‡‡
Lifetime sexual partners†				
Other-sex only	28.7	34.9	15.5‡,§	5.0‡,§,‡‡
Same-sex and other-sex	48.3	54.2	59.4	72.9‡
Same-sex only	23.0	10.8‡	25.2§	22.1
Sexual partners before age 18***				
None	31.0	41.6	6.5‡,§	0.0‡,§
Other-sex only	32.8	45.3	28.5	11.8‡,§
Same-sex and other-sex	19.6	8.5‡	32.3§	49.0‡,§
Same-sex only	16.6	4.6‡	32.7‡,§	39.1‡,§

*p<.05. ***p<.001. †p<.10. ‡Different from figure in the first column at p<.10. §Different from figure in the second column at p<.10. ††Different from figure in the third column at p<.10. ‡‡N≤3. Note: Data are weighted to reflect Add Health's complex sampling design. Percentages may not add to 100.0 because of rounding or weighting.

of 16.3 at first sexual behavior, a year later than females in the typical debut group. Of the four male classes, this one had the highest proportion of members who had engaged in only a single lifetime behavior (14%).

The second-largest male class, comprising 32% of the sample, was distinguished by the oldest average age at first sexual encounter (17.9), and largely involved vaginal intercourse and oral sex in the same year (82%). This pattern for males in the “multiple behavior” class was similar to that for females in the dual behavior group. In contrast to the percentages for the latter group, however, an additional 13% of males initiated with anal intercourse only or anal intercourse and oral sex in the same year, and 6% initiated with anal and vaginal intercourse (with or without oral sex in the same year). Eighty-one percent of males in this class identified themselves as being other than 100% heterosexual, and 35% reported having had only female partners.

Whereas a single early debut class (whose individuals typically initiated with vaginal intercourse only) emerged for females, early initiation characterized the two remaining male classes, each defined by a different behavior. The third male class—the “early anal sex” group—comprised 11% of the sample. All of its members reported having

had anal intercourse before age 18, and 65% said their initiation involved anal sex. Seventeen percent of this class identified as bisexual, and 36% identified as 100% homosexual.

The fourth male class, accounting for 6% of the sample, was distinguished by a young mean age at first sexual behavior—10 years—and long spacing between first and second behaviors (76% reported spacing of six or more years). Most respondents in this “very early debut” group initiated exclusively with oral sex (81%). Ninety-five percent of the members of this class reported having had a same-sex partner, and 73% had had both same-sex and other-sex partners.

Differences Among Classes

•**Bivariate associations.** Among females, class membership was associated with all sociodemographic characteristics but age (Table 5). The dual behavior group had the highest proportion of members who were white, whereas the early debut class had a high proportion of members who were black and a low proportion who were Asian or Pacific Islander. Females in both the early and the typical debut classes were more likely than females in the other two classes to have grown up in households with relatively low socioeconomic status (as indicated by parental education

TABLE 5. Selected sociodemographic characteristics of respondents, by sexual debut class, according to biological sex

Characteristic	Debut class				Characteristic	Debut class			
	Typical	Dual behavior	Early	Delayed with oral sex		Single behavior	Multiple behavior	Early anal sex	Very early
FEMALES					MALES				
PERCENTAGE DISTRIBUTIONS					PERCENTAGE DISTRIBUTIONS				
Race/ethnicity***					Race/ethnicity				
Hispanic	12.3	10.2	14.1	9.8	Hispanic	13.5	14.0	27.9	17.9
Black	11.1	5.2†	22.8†,‡	18.7‡	Black	13.5	9.7	12.5	8.9
Asian/Pacific Islander	4.0	3.4	1.3‡	5.2	Asian/Pacific Islander	1.7	4.6	4.0	0.2
White	72.5	81.2†	61.8†,‡	66.4‡	White	71.3	71.6	55.6	73.0
Age					Age				
24–26	26.0	25.6	22.6	23.0	24–26	18.9	16.0	4.5	9.1
27–29	53.7	55.6	51.7	49.8	27–29	46.3	48.9	68.4	51.2
30–34	20.4	18.8	25.8	27.2	30–34	34.7	35.1	27.1	39.4
Parental education level***					Parental education level				
<high school	14.1	6.6†	12.2	12.1	<high school	13.5	9.7	16.9	12.8
High school/GED	27.9	22.5	31.5‡	25.1	High school/GED	24.9	14.9	23.9	37.5
Some college/other	28.2	34.1	34.8	18.8†,‡,§	Some college/other	24.2	30.4	25.6	30.3
≥college	29.8	36.7†	21.5†,‡	44.0†,§	≥college	37.4	45.0	33.7	19.3
Neighborhood poverty*					Neighborhood poverty				
Low	58.3	59.0	49.4‡	57.2	Low	59.2	62.7	44.6	47.7
Medium	19.5	25.8†	21.5	24.5	Medium	19.2	18.1	22.2	20.3
High	22.3	15.3†	29.1‡	18.3	High	21.6	19.2	33.2	32.0
Total	100.0	100.0	100.0	100.0	Total	100.0	100.0	100.0	100.0
MEANS					MEANS				
Religiosity					Religiosity				
Public (range, 0–6)*	2.5	2.4	2.4	3.4†,‡,§	Public (range, 0–6)	2.7	2.5	2.7	1.8†
Private (range, 0–7)**	4.2	4.3	4.6	5.4†,‡,§	Private (range, 0–7)	4.3	4.1	3.8	3.6
PERCENTAGES					PERCENTAGES				
Sexual victimization prior to debut					Sexual victimization prior to debut				
Childhood sexual abuse	9.7	10.9	15.0	9.3	Childhood sexual abuse***	8.3	2.0†	19.5‡	1.0†,§
Physically forced sex	8.7	9.6	13.7	8.8	Physically forced sex*	5.6	1.3	12.6‡	13.1
Coerced sex	13.2	15.8	21.0	11.9	Coerced sex***	6.1	1.8	17.1‡	14.2
Any*	21.2	23.5	32.4†,‡	23.8§	Any**	13.7	4.8†	30.0‡	19.6

*p<.05. **p<.01. ***p<.001. †Different from figure in the first column at p<.10. ‡Different from figure in the second column at p<.10. §Different from figure in the third column at p<.10. Notes: Details about measures are given in Table 1. All variables except age and sexual victimization prior to debut were measured at Wave 1. Data are weighted to reflect Add Health's complex sampling design. Percentages may not add to 100.0 because of rounding or weighting.

and neighborhood poverty). Individuals in the early debut class were more likely than those in the other classes to have experienced any form of sexual victimization prior to sexual debut. Notably, individuals in the delayed debut with oral sex class reported the highest levels of both public and private religiosity.

In the male sample, sexual victimization was the only variable that showed substantial differences by class membership. Males in the early anal sex class were more likely than males in the multiple behavior class to report all forms of victimization before sexual debut, and males in the latter group were less likely than those in the single behavior group to report any victimization.

•**Multivariate associations.** In multivariate analyses, sexual initiation among females was associated with all sociodemographic characteristics except age and sexual victimization (Table 6). When all variables were controlled for, black females were less likely than white females to be assigned to the dual behavior debut class, instead of the typical debut class (relative risk ratio, 0.5), and females whose parents had less than a high school education, or had a high school diploma or GED, were less likely to be

so assigned than were females whose parents had at least a college education (0.4 and 0.6, respectively). In contrast, females who grew up in neighborhoods characterized by a moderate level of poverty had an increased likelihood of being in the dual behavior group, rather than the typical debut group (1.5). Black women were more likely than whites to be assigned to the early debut group, as opposed to the reference group (2.1), and private religiosity was positively associated with the likelihood of being similarly assigned (1.1). Finally, females whose parents had some college or other education were less likely than those whose parents had at least a college education to be assigned to the class of delayed debut with oral sex, rather than the typical debut class (0.4).

Among males, sexual initiation was associated with all variables except parental education level and neighborhood poverty. Males who had experienced childhood sexual abuse prior to debut were less likely than those who had not to be assigned to the multiple behavior debut class, instead of the single behavior class (relative risk ratio, 0.3). Males aged 24–26 were less likely than 27–29-year-olds to belong to the early anal

TABLE 6. Relative risk ratios (and 95% confidence intervals) from multinomial logistic regression analyses assessing associations between selected characteristics and membership in a given sexual debut class, by biological sex

Characteristic	Debut class		
FEMALES			
	Dual behavior	Early	Delayed with oral sex
Race/ethnicity			
Hispanic	0.86 (0.53–1.37)	1.29 (0.69–2.40)	0.87 (0.43–1.76)
Black	0.47 (0.28–0.77)**	2.13 (1.26–3.61)**	1.71 (0.79–3.68)
Asian/Pacific Islander	0.83 (0.36–1.86)	0.40 (0.10–1.64)	1.13 (0.35–3.59)
White (ref)	1.00	1.00	1.00
Age			
24–26	0.91 (0.60–1.38)	0.90 (0.58–1.40)	0.90 (0.50–1.63)
27–29 (ref)	1.00	1.00	1.00
30–34	0.92 (0.64–1.33)	1.16 (0.73–1.85)	1.50 (0.78–2.88)
Parental education level			
<high school	0.40 (0.23–0.69)***	0.89 (0.48–1.65)	0.58 (0.20–1.69)
High school/GED	0.64 (0.43–0.94)*	1.22 (0.74–2.02)	0.58 (0.27–1.23)
Some college/other	0.96 (0.69–1.33)	1.47 (0.87–2.47)	0.43 (0.21–0.87)*
≥college (ref)	1.00	1.00	1.00
Neighborhood poverty			
Low (ref)	1.00	1.00	1.00
Medium	1.48 (1.03–2.13)*	1.14 (0.70–1.84)	1.20 (0.65–2.22)
High	0.88 (0.56–1.36)	1.17 (0.69–2.00)	0.77 (0.35–1.68)
Religiosity			
Public	0.93 (0.85–1.02)	0.89 (0.79–1.01)†	1.06 (0.84–1.32)
Private	1.06 (0.98–1.15)	1.11 (1.01–1.22)*	1.22 (0.98–1.51)†
Sexual victimization prior to debut‡			
Childhood sexual abuse	1.10 (0.67–1.80)	1.30 (0.71–2.39)	1.07 (0.52–2.22)
Physically forced sex	1.02 (0.55–1.89)	1.28 (0.63–2.59)	1.17 (0.36–3.76)
Coerced sex	1.25 (0.73–2.15)	1.40 (0.67–2.90)	0.84 (0.32–2.21)
MALES			
	Multiple behavior	Early anal sex	Very early
Race/ethnicity			
Hispanic	1.03 (0.41–2.56)	3.02 (0.95–9.60)†	0.81 (0.22–2.94)
Black	0.88 (0.39–1.98)	0.85 (0.26–2.85)	0.45 (0.13–1.55)
Asian/Pacific Islander	3.22 (0.78–13.23)	2.45 (0.13–46.11)	0.15 (0.03–0.80)*
White (ref)	1.00	1.00	1.00
Age			
24–26	0.76 (0.30–1.95)	0.17 (0.05–0.59)**	0.41 (0.09–1.86)
27–29 (ref)	1.00	1.00	1.00
30–34	0.90 (0.49–1.64)	0.52 (0.18–1.47)	0.87 (0.30–2.55)
Parental education level			
<high school	0.73 (0.28–1.90)	0.62 (0.15–2.54)	1.11 (0.10–12.15)
High school/GED	0.49 (0.23–1.07)†	0.74 (0.28–1.96)	2.54 (0.59–11.05)
Some college/other	1.03 (0.47–2.27)	0.72 (0.24–2.18)	1.90 (0.52–6.87)
≥college (ref)	1.00	1.00	1.00
Neighborhood poverty			
Low (ref)	1.00	1.00	1.00
Medium	1.00 (0.43–2.32)	1.52 (0.44–5.27)	1.07 (0.28–4.03)
High	1.12 (0.52–2.41)	1.94 (0.73–5.18)	1.98 (0.68–5.76)
Religiosity			
Public	0.92 (0.76–1.11)	1.26 (0.92–1.73)	0.81 (0.65–0.99)*
Private	1.01 (0.88–1.15)	0.79 (0.58–1.05)	1.04 (0.82–1.32)
Sexual victimization prior to debut‡			
Childhood sexual abuse	0.25 (0.07–0.96)*	2.65 (0.80–8.81)	0.07 (0.01–0.37)**
Physically forced sex	0.44 (0.07–2.93)	0.77 (0.08–7.49)	1.81 (0.13–25.61)
Coerced sex	0.51 (0.11–2.45)	3.55 (0.32–39.14)	2.13 (0.17–26.06)

*p<.05. **p<.01. ***p<.001. †p<.10. ‡The measure of any sexual victimization was excluded because of multicollinearity with other victimization variables. Notes: Analyses compare membership in the classes shown with membership in the typical debut class for females and the single behavior class for males. Public and private religiosity are scaled measures; sexual victimization measures are dichotomous. All models were weighted to reflect Add Health's complex sampling design. Details about measures are given in Table 1. All variables except age and sexual victimization prior to debut were measured at Wave 1. ref=reference group.

sex group, rather than the reference group (0.2). And finally, Asian or Pacific Islander males were less likely than white males to be assigned to the very early debut class, as opposed to the single behavior class (0.2), and

individuals who reported a higher level of public religiosity or childhood sexual abuse prior to debut had a reduced likelihood of being similarly assigned (0.8 and 0.1, respectively).

DISCUSSION

We identified eight unique patterns of sexual initiation, distinguished by timing, sequence and behaviors, among sexual minorities. Results differed from those seen among the heterosexual respondents examined by Haydon and colleagues.²⁰ For example, these researchers found that 39% of heterosexuals initiated exclusively with vaginal intercourse, compared with 33% who did so in our sexual minority sample, and that 17% initiated with some other behavior, compared with 28% in our sample. Taken together, these findings highlight how an exclusive focus on vaginal intercourse as the definition of sexual initiation can misclassify adolescents—particularly those who are sexual minorities—as sexually inexperienced.

In the present study, notable sociodemographic differences in initiation patterns emerged within each sex. For example, black women were more likely than white women to be in the early debut class, and less likely to be in the dual behavior class, as opposed to the typical debut class. In addition, because the early debut class was characterized by several indicators traditionally associated with sexual risk, our results parallel findings in the general adolescent health literature that black females typically report more sexual risk-taking (particularly earlier age at first vaginal intercourse) than do peers of other racial or ethnic backgrounds, regardless of sexual orientation.^{40,41} When considered from an intersectional perspective—which focuses on how multiple minority identities can intersect to affect health—these results may reflect the “triple jeopardy” faced by black sexual minority females. Such individuals embody three identities that may be related to vulnerability, resulting in exposure to unique stressors and stigmas that are associated with increased sexual risk.^{42,43} That females in the early debut class were also more likely than females in the other classes to experience at least one form of sexual victimization prior to sexual debut in bivariate models further corroborates this hypothesis. Interestingly, given that Asian or Pacific Islander males were less likely than whites to be assigned to the very early debut class, as opposed to the single behavior debut group, it appears that membership in some minority racial or ethnic groups may be associated with later sexual initiation.

Religiosity was a significant covariate for both females and males. In multivariate analyses, stronger public religiosity was associated with a reduced likelihood of belonging in the very early debut class for males. Because religious participation has been found to be associated with reduced sexual risk (including early initiation) for heterosexual adolescents,^{10,44} the present finding suggests that this relationship may extend to sexual minorities. However, stronger private religiosity was associated with an increased likelihood of membership in the early debut class for females; this finding appears to contradict the expected relationship between religiosity and sexual risk behavior, as well as the public religiosity finding among males. Consideration of other social and demographic characteristics may offer an

explanation. Previous studies have noted that individuals who were affiliated with less gay-affirming denominations perceived their religious identity and sexual identity to be in conflict, and that such individuals may be at increased risk of higher rates of internalized homophobia and depression.^{11,45,46} At the same time, both internalized homophobia and depression have been positively associated with an elevated risk of engaging in risky health behaviors, particularly among individuals from racial or ethnic backgrounds in which religion has traditionally played a central role in norms and values. The fact that black females were more likely than whites to be in the early debut class, instead of the typical debut class, may partially explain these findings. Though we were unable to test these hypotheses, we believe that further research on the relationship between religion and sexual behavior among sexual minority females may lead to a better understanding of sexual risk that could help improve future interventions.

Limitations and Strengths

This study has several limitations. Most notably, the biological sex of the partner involved in each initiation experience was not reported, so patterns likely reflect a mixture of same-sex and other-sex encounters. Given qualitative evidence that the emotional salience of same-sex first encounters may differ from that of other-sex first encounters,⁷⁻⁹ future studies should consider partners' biological sex when assessing sexual behaviors.

A second limitation is that our sample was predominantly female, likely because of how we defined sexual minority status, which included identification as “mostly heterosexual” (endorsed by 66% of females and 41% of males). However, this pattern conforms to prevailing theories that women conceive of their sexual identity more fluidly than males.⁴⁷⁻⁵¹

A third limitation is the potential for recall bias and misreported initiation ages, partly attributable to retrospective reporting. However, a previous study found that 85% of Add Health respondents reported their age at first vaginal sex consistently in Waves 3 and 4 (seven years apart),⁵² suggesting a high level of reliability in adult retrospective reports of early sexual behavior. It is unclear if similar reliability would be replicated with reports of oral and anal sex.

Finally, our results may be limited by the age of the data. Though the majority of data were reported in 2008, the Add Health sample reflects the experiences of individuals who were in high school in 1994–1995, and therefore may not be generalizable to the experiences of their counterparts today. Given that encountered stigma, victimization and harassment have been linked to increased sexual risk among sexual minority youth,^{14,53-57} societal and political shifts regarding homosexuality and sexual minority individuals, as well as increased social acceptance of sexual minority groups in recent years,^{58,59} may mean that contemporary sexual initiation patterns among this population do not resemble those seen in the present study.

This study also has several notable strengths. To our knowledge, this represents the first attempt to understand initiation patterns specific to sexual minority populations, and the first to incorporate measures of multiple sexual behaviors. Use of latent class analysis to model sexual initiation as a behavioral pattern, rather than examination of a single dichotomous behavior, in this population is also novel. Furthermore, this methodology allows patterns to emerge from the data, hence reflecting individuals' own experiences rather than relying on assumptions about "typical" sexual initiation patterns.

Conclusions

This study serves as a reminder to clinicians and researchers of the importance of collecting information on sexual behaviors other than vaginal intercourse. Existing sexual initiation measures suffer from a heteronormative view of sex that focuses almost exclusively on vaginal intercourse, which may lead to missed opportunities for health counseling and screening. For example, males whose first sexual behavior is anal intercourse would be viewed as virgins, and consequently at low sexual risk, even though anal intercourse carries a substantially higher risk of HIV or STD transmission than vaginal intercourse. Moreover, individuals who initiate with vaginal intercourse and oral sex in the same year differ from those who initiate with vaginal intercourse alone, a nuance that would be missed if only the latter behavior is considered. Hence, the inclusion of multiple sexual behaviors is critical when assessing sexual initiation, particularly among sexual minority youth.

From a research perspective, the present analysis is a salient reminder of recent and upcoming changes in the collection of sexual orientation data. Several nationally representative surveys have begun to include measures of sexual orientation: The National Health Interview Survey incorporated a measure of sexual identity in the survey of health care utilization in 2013,⁶⁰ and the Youth Risk Behavior Surveillance System included measures of sexual identity and sexual partners in the standard demographic questionnaire portion in 2015, mandating its use at any site administering the survey.⁶¹ Similarly, under the upcoming Stage 3 Meaningful Use rollout of electronic health records across U.S. health care settings, all systems that wish to be eligible for enhanced Medicaid and Medicare reimbursements must include space to assess both the sexual orientation and the gender identity of patients.⁶² These changes will dramatically increase the availability of sexual orientation data, and we believe that any study of the health of sexual minority populations should include behavioral indicators that are most relevant to these individuals.

This study provides a foundation for the use of sexual minority initiation classes in analyses focusing on sexual and reproductive health later in life. Future studies should aim to devise a sexual minority-specific model of the pathways from sexual initiation to young adult sexual and reproductive health that account for the social determinants, stressors and contexts unique to sexual minority populations.

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Acknowledgments

The Add Health program project was funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. No direct support was received from grant P01-HD31921 for this analysis. The authors' work was supported by NICHD grant R01HD57046 and Carolina Population Center grant 5 R24 HD050924.

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