

Predictors of Early Initiation of Vaginal and Oral Sex Among Urban Young Adults in Baltimore, Maryland

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Over the past three decades, most research on adolescent sexual behavior has focused on vaginal intercourse and related behaviors, including contraception and unintended pregnancy. In this study, we describe the prevalence and correlates of vaginal, oral, and anal sex in an epidemiologically defined population in Baltimore, Maryland. Young adults (ages 18–24), who had been enrolled in a behavioral intervention trial during elementary school, were interviewed by telephone between 1998 and 2002 to assess their sexual behavior. Of 1679 respondents interviewed, 70.8% were Black and 55% were women. Overall, 93% of the young adults reported vaginal intercourse, 78% reported receiving oral sex, 57% reported performing oral sex, and 10% reported receptive anal intercourse. Among men, 27% reported insertive anal intercourse. Blacks initiated vaginal intercourse at an earlier age than Whites; White women performed oral sex earlier than Black women. Significant interactions were observed between age of first vaginal partner and both gender and race/ethnicity. Blacks with older partners initiated sex at an earlier age than both Blacks with a partner the same age or younger and Whites. We also observed a relationship between older female sex partners and earlier vaginal sex initiation among men. We conclude that older sex partners play an important role in sexual initiation among young adults. In light of the rates of oral and anal sex, sexual education and intervention programs should address the risk for unintended consequences of these behaviors.

KEY WORDS: sexual behavior; young adults; older sex partners; oral sex; anal sex.

INTRODUCTION

Adolescents and young adults are often at increased risk for unintended consequences of sex. Along with HIV and other sexually transmitted diseases (STDs), mistimed and unwanted pregnancies are an important consequence of adolescent and young adult sexual behavior. According to the National Survey of Family Growth (NSFG), only 34.3% of births to women under the age of 20 were

intended as compared 61.1% for women aged 20–24 and 77.8% for women aged 25–29 (National Center for Health Statistics, 1997). While recent analyses from the youth risk behavior study (YRBS) have suggested that the prevalence of sexual intercourse decreased among U.S. high school students between 1991 and 2001 (Centers for Disease Control and Prevention, 2002a), it remains the case that almost one-half of U.S. high school students have had sexual intercourse in their lifetime, while

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approximately 7% initiated sexual intercourse before the age of 13 (Centers for Disease Control and Prevention, 2002b). Abstinence-focused sexuality education is becoming increasingly predominant (Darroch, Landry, & Singh, 2000). Since 1996, abstinence-only education has received a nearly 3000% funding increase, with \$60 million approved by Congress for 2000–2002 (Starkman & Rajani, 2002). With this recent emphasis on abstinence-only programming, it becomes imperative that we have a clear understanding of the kinds and prevalence of sexual behaviors in which adolescents and young adults are engaged as well as their correlates, particularly of early initiation.

Most of the research on adolescent sexual behavior over the past three decades has focused on vaginal intercourse and related behaviors, including contraception and unintended pregnancy. More recently, researchers have begun to study the frequency and natural history of sexual activity other than vaginal intercourse among adolescents. National probability survey data from a study of adult sexual practices in the United States estimated that 76.6% of men and 67.7% of women have performed oral sex and 78.7% of men and 73.1% of women have received oral sex in their lifetime (Laumann, Gagnon, Michael, & Michaels, 1994). Rates of oral sex are typically lower among adolescents, ranging between 35 and 66% in the 1980s and 1990s (Coles & Stokes, 1985; Edgardh, 2002; Gates & Sonenstein, 2000; Newcomer & Udry, 1985), and among Blacks (Billy, Tanfer, Grady, & Klepinger, 1993).

The literature surrounding anal intercourse among homosexual and bisexual men is considerable. However, data describing anal intercourse in heterosexual men and women are sparse, and even more so among adolescents. Approximately 25.6% of adult heterosexual men and 20.4% of adult heterosexual women have reported a lifetime history of anal sex (Laumann et al., 1994) while rates among adolescents range between 20 and 32% (Edgardh, 2002; Evans et al., 1995; Gross et al., 2000; Kraner, McCoy, Evans, Evans, & Sweeney, 2001). Reported correlates of anal sex include unprotected vaginal sex, illegal drug use, and sexually transmitted diseases (Friedman et al., 2001; Gross et al., 2000).

Several demographic characteristics have been shown to be associated with initiation of sexual behaviors, including gender and race. Regarding gender, several studies have reported that men initiate intercourse at an earlier age than women (Alexander & Hickner, 1997; Centers for Disease Control and Prevention, 1998; Durbin et al., 1993; Mott, Fondell, Hu, Kowaleski-Jones, & Menaghan, 1996; Paul, Fitzjohn, Herbison, & Dickson, 2000; Warren et al., 1997). The National Longitudinal Study of Youth reported that the median age of first sex was younger for boys as

compared to girls (15.9 and 16.1 years, respectively) (Mott et al., 1996). Ethnicity and race/ethnicity have also been studied as correlates and predictors of sexual behaviors among adolescents and young adults, with Black adolescents generally being more likely to report sexual behavior as compared to White adolescents (Wilson, 1986). In addition, Black adolescents have been shown to have an almost three- to four-fold increased risk for earlier sexual debut and a four-fold increased risk for ever having three or more sex partners (Durbin et al., 1993; Mott et al., 1996; Paul et al., 2000). In their study of inner-city middle school students, Santelli, Lowry, Brener, and Robin (2000) also found that Black students were significantly more likely to initiate intercourse at an earlier age compared to Whites, Asians, and others. The NSFG revealed that throughout the 1980s and 1990s, Black adolescents consistently had a higher rate of lifetime history of sexual intercourse as compared to White adolescents (Singh & Darroch, 1999). Hispanic adolescents were more likely to have an older boyfriend or girlfriend and three or more sex partners as compared to White, Black, Asian/Pacific Islander, and American Indian/Alaskan Native sixth graders in Northern California (Marín, Coyle, Gomez, Carvajal, & Kirby, 2000). The extent to which these associations are related to race and ethnicity or to some unmeasured confounder like socioeconomic status has not been examined and we begin to do so in this study.

Adolescent sexual behavior has often been examined within the context of substance use. Substance use has often been cited as a predictor of early sexual behavior (Andersson-Ellström, Forssman, & Milsom, 1996; Paul et al., 2000; Ramrakha, Caspi, Dickson, Moffitt, & Paul, 2000; Rosenbaum & Kandel, 1990; Smith, 1997). For example, adolescents with substance disorders were 2.1 times more likely to have initiated sexual intercourse before age 16 as compared to non-substance using adolescents (Ramrakha et al., 2000).

Previous research has also examined the relationship between one's sexual partners and initiation. In particular, having an older sex partner has been identified as a correlate of risky sexual behavior among adolescents. In the National Longitudinal Study of Adolescent Health, it was found that adolescent girls with an older partner were more likely to have sex than girls with partners their own age (Kaestle, Morisky, & Wiley, 2002). Adolescents who have older sexual partners are less likely to use condoms (DiClemente et al., 2002; Sturdevant et al., 2001), more likely to have vaginal sex at a younger age (Miller, Clark, & Moore, 1997), have a sexual partner who has multiple sex partners (Begley, Crosby, DiClemente, Wingood, & Rose, 2003), be HIV infected (Gregson et al., 2002; Kelly et al., 2003), and have an STD (Begley et al., 2003).

Clearly, understanding the prevalence and age of onset of a variety of sexual behaviors as well as their correlates is important for directing education and preventive interventions, particularly since these sexual behaviors may be important correlates of risky sexual behavior (e.g., infrequent condom use) in addition to carrying risk for HIV and STDs. In this article, we examine the sexual behavior of a community-based sample recruited during first grade in public schools in Baltimore, Maryland between 1985 and 1986 and followed through 2002.

METHOD

Participants

The Johns Hopkins University Prevention Intervention Research Center intervention trial began in 1985 and has been described previously (Dolan et al., 1993; Kellam et al., 1991; Kellam, Rebok, Ialongo, & Mayer, 1994; Koenig, Ialongo, Wagner, Poduska, & Kellam, 2002; Pearson, Ialongo, Hunter, & Kellam, 1994). Briefly, 2311 urban first-graders from 43 classrooms in 19 elementary schools located in five sociodemographically distinct areas in eastern Baltimore were targeted for enrollment into the study. The areas differed in terms of ethnicity, type of housing, family structure, income, unemployment, violent crime, suicide, and school drop out rates. The children were first assessed at age 6 as part of an evaluation of two school-based, universal preventive interventions targeting early learning (mastery learning (ML)) and aggression (the good behavior game (GBG)) (Kellam & Rebok, 1992). Three to four schools—closely matched in terms of school size, achievement levels, promotion rates, and a variety of sociodemographic variables—were selected from each of five areas. Schools were randomly assigned to either an intervention or control condition within a geographic area. The interventions were in place throughout the course of first and second grade and only during those grades. The study was reviewed and approved by the institutional review board of the Johns Hopkins School of Hygiene and Public Health. Written informed consent from parents and verbal consent from children was received prior to data collection when the study was initiated in first grade.

Of the 2311 participants recruited into the initial intervention trial, 1715 (74.2%) completed a telephone interview at the young adult follow-up. For this analysis, 17 participants were excluded based on their race/ethnic group (Asian, Native American, and Hispanic) because of limited ability to make comparisons due to insufficient numbers. We also excluded 19 men who reported having

Table I. Demographic Characteristics of 1679 Adolescents Enrolled in the Johns Hopkins Prevention Intervention Research Center's Intervention Trial, Baltimore, Maryland, 1998–2002

	<i>N</i>	%
Mean age at young adult visit (in years)	1679	19.5
<i>SD</i>		0.9
Gender		
Female	924	55.0
Male	755	45.0
Race		
White	491	29.2
Black	1188	70.8
Study design		
Standard	977	58.2
Good behavior game	338	20.1
Mastery learning	364	21.7
Ever been verbally or physically forced to have sex	1614	8.1
Ever had a same-sex sex partner	1679	5.4
Low-income family ^a	1673	70.1
Parent had <12th grade education	1083	28.9
High school diploma or GED	1674	54.4
Currently in school or employed	1676	78.9

^aParticipated in free lunch program in elementary school.

vaginal intercourse with a man, resulting in a final sample size of 1679. Demographic characteristics of the young adult sample are provided in Table I. Exposure to the intervention did not differ by most demographic characteristics. However, a higher proportion of Whites were in the standard classrooms and a higher proportion of Blacks were in the GBG classrooms.

Beginning in the summer of 1998 and continuing through 2002, project interviewers conducted a standardized telephone interview with each respondent, as each cohort passed through the ages of 18–19. Verbal consent was obtained for the young adult follow-up telephone interviews prior to data collection.

Measures

Basic demographic data (sex, race/ethnicity, and age) were collected in the first grade, while socioeconomic indicators and family variables were collected during the sixth grade. Parental income and education were used as a proxy for socioeconomic status. Low income was approximated using data on enrollment in the national school free lunch program, a federally funded program that provides free meals to students whose parents' income was less than or equal to 130% of the national poverty level (United States Congress, 2000). Children were considered to be from low-income families if they had been enrolled in the free lunch program at least once during elementary

school (grades one through six). Parental education was assessed during the parental interview during sixth grade. Analyses of parental education were limited to biological parents. Parental divorce and death were also assessed during the sixth grade. Work/school status was assessed using current self-reported employment (i.e., full- and part-time work) or educational (i.e., current student in high school, GED program, 2- or 4-year college, or vocational school) status. Respondents could be both employed and in school.

During the young adult interview, respondents were asked a series of questions addressing five types of sexual behaviors that may have occurred during their lifetime: vaginal intercourse (defined as “when a boy or man inserts his penis into a girl or woman’s vagina”), receptive anal intercourse (defined as “when you put your penis into the anus or butt of another person”), insertive anal intercourse (defined as “when a boy or man puts his penis into your anus or butt”), performing oral sex (defined as “when you put your mouth on someone’s penis, vagina, anus or butt”), and receiving oral sex (defined as “when someone puts their mouth on your penis, vagina, anus or butt”). Only men were asked about insertive anal intercourse. Participants were asked the age at which they first engaged in each behavior and the categorical age (same age, five or more years older, or 5 years younger) of their first partner. The number of sexual partners for each sex and age category was assessed for each of the five types of sexual behaviors. In addition, participants were asked, “Has anyone ever used physical or verbal force to make you have sex with them?” to assess instances of forced sex. Specific wording of all questions is available on the internet (<http://www.bpp.jhu.edu>).

RESULTS

Figure 1 depicts the overlap between lifetime vaginal, oral, and anal sex among the entire sample by sex. Approximately half (53%) of women reported having vaginal and oral sex in their lifetime; 24% of women had only had vaginal sex and 14% reported oral, anal, and vaginal sex. Approximately half (52%) of men reported having vaginal and oral sex in their lifetime (52%); 24% of men had vaginal, oral, and anal sex and 15% only had vaginal sex. In terms of sexual behavior trajectories, vaginal sex tended to precede other behaviors. Among women who had both vaginal and oral sex, 70.2% had vaginal sex first, 24.3% had vaginal and oral sex at the same age, and 5.5% had oral sex first (data not shown). For men who had both vaginal and oral sex, 66.2% had vaginal sex before oral sex, 18.4% had vaginal and oral

sex at the same age, and 11.1% had oral sex first (data not shown). For the men who had oral, anal, and vaginal sex, 35.0% had vaginal first followed by oral and then anal and 25.1% had vaginal and oral sex at the same age followed by anal sex (data not shown).

Overall, 93.4% of the sample reported having vaginal intercourse, 78.2% reported receiving oral sex, 56.5% reported performing oral sex, and 9.8% reported receptive anal intercourse in their lifetime (Table II). Among men, 27.3% reported engaging in insertive anal intercourse. The mean age of initiation of vaginal intercourse was 14.8 years, with 25.6% reporting initiation prior to age 14. The mean age at which participants reported performing and receiving oral sex was 16.5 and 15.9 years, respectively.

We next assessed potential race/ethnicity differences by sex. Among women, Blacks were significantly more likely to report vaginal intercourse as compared to Whites (crude odds ratio [OR] = 2.76, 95% confidence interval [CI]: 1.59, 4.78). Black women reported a younger mean age at vaginal intercourse initiation than White women (15.1 vs. 15.8 years, $p < .001$).

Conversely, White women were more likely to report receiving oral sex, although this association was not statistically significant (crude OR = 1.39, 95% CI: 0.96, 2.00). White women were also significantly more likely to report performing oral sex as compared to Black women (crude OR = 4.92, 95% CI: 3.52, 6.88). White women also reported performing oral sex for the first time at a significantly younger mean age (16.4 vs. 17.6 years, $p < .001$). Compared to White women, Black women were significantly more likely to have an older partner the first time they ever had vaginal intercourse (crude OR = 2.01, 95% CI: 1.27, 3.27) or oral sex (received crude OR = 1.61, 95% CI: 0.97, 2.76, performed crude OR = 3.78, 95% CI: 1.99, 7.51).

Among men, Blacks were significantly more likely to report vaginal intercourse as compared to Whites (crude OR = 2.13, 95% CI: 1.21, 3.74). Black men also reported a younger mean age at vaginal intercourse initiation than White men (13.8 vs. 15.0 years, $p < .001$). Conversely, White men were significantly more likely to report both receiving oral sex (crude OR = 1.94, 95% CI: 1.24, 3.02) and performing oral sex (crude OR = 2.82, 95% CI: 1.94, 4.10) as compared to Black men. There were no significant differences in the age of onset of anal intercourse and oral sex among Black and White men. Black men were significantly more likely to initiate insertive anal intercourse (crude OR = 5.04, 95% CI: 1.81, 17.26) and oral sex (received crude OR = 3.59, 95% CI: 2.04, 6.63, performed crude OR = 3.72, 95% CI: 1.73, 8.90) with an older partner.

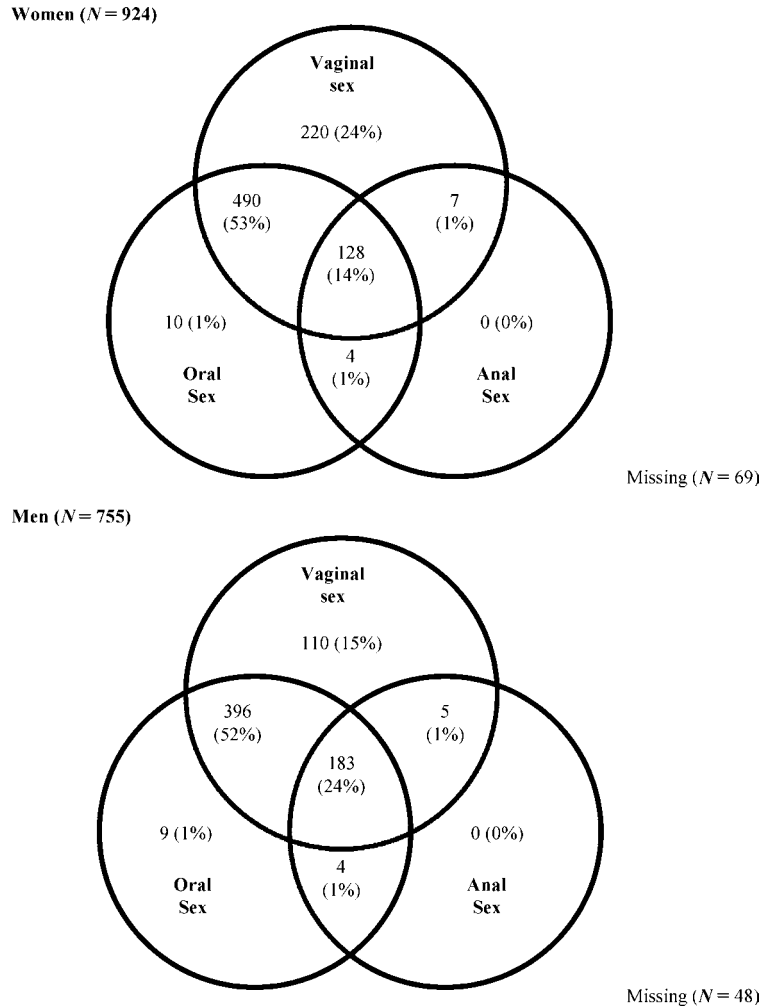


Fig. 1. Venn diagrams illustrating the overlap among lifetime vaginal, oral, and anal sex among 1679 young adults in Baltimore, Maryland, stratified by gender.

In Tables III and IV, we present the final mixed-effect multivariate linear regression models for initiation of vaginal intercourse and oral sex. Variables that demonstrated a significant crude association in the bivariable analysis, as determined through the use of *p* values and 95% confidence intervals, were entered into the models. Variables were retained in the multivariate model if they were significant at the .05 level. To account for the correlation between participants who were randomized in the same classroom, we included first grade classroom assignment as a random effect. Study design (standard, GBG, or ML classroom) was included in each model; however, study design was not significantly associated with sexual behavior, and was excluded from final models in the interest of parsimony. Interactions were tested between all variables, but only those that remained

significant were retained in the model. The final models were adjusted for all the other variables in the model.

Of 10 variables entered into the model for vaginal sex initiation, five variables were statistically significant independent correlates and thus retained in the final adjusted model. Three variables were included in the form of two interactions (Table III). In the adjusted linear regression model, experiencing forced sex, lifetime cigarette use, and lifetime marijuana use were associated with a younger age of initiation. Having a high school diploma (or equivalent) and being in school or employed were both associated with older age of initiation. There was a significant interaction between the age of the first vaginal partner and sex. Men who initiated vaginal sex with an older partner were younger than men who initiated vaginal sex with a partner the same age or younger

Table II. Sexual Behaviors of 1679 Male and Female Adolescents Enrolled in the Johns Hopkins Prevention Intervention Research Center's Intervention Trial, Stratified by Race/Ethnicity

	Female			Male			Overall p^c
	Total	Black (N = 671)	White (N = 253)	Black (N = 517)	White (N = 238)	$p^{a,b}$	
Ever had vaginal intercourse (%)	1647	93.4%	95.7%	89.0%	94.6%	.007	<.001
Mean age at 1st vaginal intercourse (SD)	1528	14.8 (2.3)	15.1 (2.0)	15.8 (1.6)	13.8 (2.5)	<.001	<.001
						$df = 685$	
						$t = 6.06$	
Age of 1st vaginal intercourse partner	1513					ns	.002
5 or more years older	18.5%	22.4%	12.6%	18.2%	13.7%		
About the same age	80.8%	71.4%	87.4%	81.6%	85.4%		
5 years younger	0.7%	1.3%	0.0%	0.2%	1.0%		
Ever received oral sex (%)	1561	78.2%	74.1%	79.9%	78.0%	.077	.001
Mean age at 1st receptive oral sex (SD)	799	15.9 (2.2)	16.5 (1.8)	16.1 (2.1)	16.0 (2.4)	.057	<.001
						$df = 364$	
						$t = -6.54$	
Age of 1st sex partner who performed oral sex	802					.007	<.001
5 or more years older	15.1%	22.1%	12.8%	26.1%	9.0%		
About the same age	84.2%	76.7%	87.2%	73.4%	90.0%		
5 years younger	0.8%	1.2%	0.0%	0.5%	1.1%		
Ever performed oral sex (%)	1550	56.5%	37.2%	74.5%	59.8%	<.001	<.001
Mean age at 1st performed oral sex (SD)	1149	16.5 (2.1)	17.6 (1.6)	16.4 (1.8)	15.4 (2.4)	<.001	<.001
						$df = 596$	
						$t = -1.91$	
Age of 1st sex partner on whom oral sex was performed	1160					<.001	<.001
5 or more years older	19.8%	26.6%	8.8%	16.8%	5.1%		
About the same age	79.4%	71.9%	91.2%	82.8%	93.7%		
5 years younger	0.8%	1.5%	—	1.4%	1.1%		
Ever had receptive anal intercourse (%)	1520	9.8%	15.5%	18.6%	2.3%	ns	<.001
Mean age at 1st receptive anal intercourse (SD)	143	17.8 (1.7)	18.0 (1.6)	17.9 (1.6)	15.8 (2.4)	ns	.003
Age of 1st receptive anal intercourse partner	144					ns	ns
5 or more years older	29.9%	31.8%	25.6%	25.0%	25.0%		
About the same age	70.1%	68.2%	74.4%	75.0%	75.0%		
5 years younger	—	0.0%	0.0%	0.0%	0.0%		
Ever had insertive anal intercourse (%)	704	27.3%	—	—	26.8	ns	—
Mean age at 1st insertive anal intercourse (SD)	183	16.9 (2.4)	—	—	16.7 (2.4)	ns	—
Age of 1st insertive anal intercourse partner	186					ns	.001
5 or more years older	23.1%	—	—	—	8.1%		
About the same age	75.8%	—	—	—	91.9%		
5 years younger	1.1%	—	—	—	0.0%		

^aPearson χ^2 used for comparing proportions.^bStudent's t -test used for comparing means.^cANOVA used for comparing means.

Table III. Multivariate Linear Regression Model Predicting Age of Initiation of Vaginal Sex Among 1679 Male and Female Adolescents Enrolled in The Johns Hopkins Prevention Intervention Research Center’s Intervention Trial

	Crude association		Final model ^a	
	Adjusted mean (SE)	<i>p</i>	Adjusted mean (SE)	<i>p</i>
Gender		<.001		
Male	14.2 (0.1)			
Female	15.3 (0.1)			
Race/ethnicity		<.001		
White	15.4 (0.1)			
Black	14.5 (0.1)			
Ever been verbally or physically forced to have sex		<.001		<.001
No	14.8 (0.1)		14.6 (0.1)	
Yes	14.0 (0.2)		13.9 (0.2)	
Ever had a same-gender sex partner		<i>ns</i>		
No	14.8 (0.1)			
Yes	14.7 (0.3)			
Low-income family		<.001		
No	15.3 (0.1)			
Yes	14.6 (0.1)			
Parent had <12th grade education		<.001		
No	14.3 (0.1)			
Yes	14.8 (0.1)			
High school diploma or GED		<.001		<.001
No	14.2 (0.1)		14.0 (0.1)	
Yes	15.3 (0.1)		14.5 (0.1)	
Currently in school or employed		<.001		.014
No	14.1 (0.1)		14.1 (0.2)	
Yes	14.9 (0.1)		14.4 (0.1)	
Ever smoked cigarettes		<.001		<.001
No	15.1 (0.1)		14.6 (0.1)	
Yes	13.9 (0.1)		13.9 (0.1)	
Ever smoked marijuana		<.001		<.001
No	15.4 (0.1)		14.6 (0.1)	
Yes	14.2 (0.1)		13.9 (0.1)	
Ever drink alcohol		<.001		
No	15.2 (0.1)			
Yes	14.6 (0.1)			
Age of first vaginal sex partner		<.001		
About the same age or 5 years younger	14.9 (0.1)			
5 or more years older	14.0 (0.2)			
Interactions				
Gender by 1st vaginal sex partner ≥5 years older				<.001
Female and younger/same age partner			14.9 (0.1)	
Female and older partner			14.8 (0.2)	
Male and younger/same age partner			14.2 (0.1)	
Male and older partner			13.1 (0.2)	
Race/ethnicity by 1st vaginal sex partner ≥5 years older				.020
White and younger/same age partner			15.1 (0.1)	
White and older partner			14.8 (0.3)	
Black and younger/same age partner			14.1 (0.1)	
Black and older partner			13.0 (0.2)	

^aAdjusted for all variables included in the final model.

(13.1 years vs. 14.2 years, *p* < .001). There was also a significant interaction between race/ethnicity and the age of the first vaginal partner. Blacks who initiated vaginal sex with an older partner were younger than Blacks who

initiated vaginal sex with a partner the same age or younger (13.0 years vs. 14.1 years, *p* < .001). Whites who initiated vaginal sex with an older partner were older at vaginal sex initiation than Black participants,

Table IV. Multivariate Linear Regression Model Predicting Age of Initiation of Oral Sex Among 1679 Male and Female Adolescents Enrolled in The Johns Hopkins Prevention Intervention Research Center's Intervention Trial

	Performed oral sex			Received oral sex		
	Crude association		Full model ^a	Crude association		Full model ^a
	Adjusted mean (SE)	p	Adjusted mean (SE)	Adjusted mean (SE)	p	Adjusted mean (SE)
Gender						
Male	16.4 (0.1)	<.001		16.0 (0.1)	<.001	15.1 (0.2)
Female	15.4 (0.1)			17.0 (0.1)		15.9 (0.2)
Race/ethnicity						
White	15.8 (0.1)	<i>ns</i>		16.2 (0.1)		
Black	16.0 (0.1)			16.8 (0.1)		
Ever been verbally of physically forced to have sex		.005			<i>ns</i>	
No	16.0 (0.1)		16.2 (0.1)			
Yes	15.3 (0.3)		15.7 (0.2)			
Ever had a same-gender sex partner		<.001			.001	
No	16.0 (0.1)		16.4 (0.1)			15.9 (0.1)
Yes	15.0 (0.3)		15.5 (0.3)			15.0 (0.3)
Low-income family		<i>ns</i>			<i>ns</i>	
No	16.3 (0.1)			16.0 (0.1)		
Yes	16.5 (0.1)			15.9 (0.1)		
Parent had <12th grade education		<i>ns</i>			<i>ns</i>	
No	16.5 (0.1)			16.0 (0.1)		
Yes	16.5 (0.2)			15.7 (0.2)		
High school diploma or GED		<.001			<i>ns</i>	
No	15.6 (0.1)			16.4 (0.1)		15.3 (0.2)
Yes	16.2 (0.1)			16.5 (0.1)		15.7 (0.2)
Currently in school or employed		<i>ns</i>			.022	
No	16.4 (0.1)			15.6 (0.1)		
Yes	16.5 (0.1)			16.0 (0.1)		
Ever smoked cigarettes		<.001			<.001	
No	16.2 (0.1)			16.7 (0.1)		
Yes	15.3 (0.1)			16.0 (0.1)		
Ever smoked marijuana		<.001			<.001	
No	16.5 (0.1)		16.2 (0.2)			
Yes	15.6 (0.1)		15.8 (0.2)			
Ever drink alcohol		<.001			.001	
No	16.7 (0.1)		17.1 (0.2)			15.7 (0.2)
Yes	15.8 (0.1)		16.4 (0.1)			15.3 (0.2)

Age of 1st sex partner who performed oral sex					
About the same age or 5 years younger	14.8 (0.1)				
5 or more years older	13.7 (0.3)				
Age of 1st sex partner on whom oral sex was performed					
About the same age or 5 years younger		14.8 (0.1)			
5 or more years older		13.8 (0.2)			
Interactions					
Gender by Race/ethnicity					
White female			15.9 (0.2)		
Black female			17.0 (0.2)		
White male			15.4 (0.2)		
Black male			15.5 (0.2)		
Smoked cigarettes by smoked marijuana					.023
No cigarettes or marijuana				15.7 (0.2)	
Cigarettes only				16.0 (0.3)	
Marijuana only				15.4 (0.2)	
Marijuana and cigarettes				14.9 (0.2)	

^a Adjusted for all variables included in the final model.

but younger than Whites who initiated vaginal sex with a partner the same age or younger (14.8 years vs. 15.1 years, $p < .001$).

Several variables were associated with a younger age at initiating oral sex (Table IV). Of 10 variables entered into the model for oral sex performance, three variables were statistically significant independent correlates and thus retained in the final adjusted model. Two variables were included in the form of an interaction (Table IV). Experiencing forced sex, ever smoking marijuana, and ever having a same-gender sex partner were associated with younger age at first oral sex performance. There was a significant interaction between gender and race/ethnicity. Black women were significantly older than White women, as well as Black and White men, the first time they performed oral sex.

Of nine variables entered into the model for receiving oral sex, five variables were statistically significant independent correlates and thus retained in the final adjusted model. Two variables were included in the form of an interaction (Table IV). Male gender, ever having a same-gender sex partner, experiencing forced sex, not having a high school diploma (or equivalent), and ever consuming alcohol were significantly associated with receiving oral sex at a younger age. A significant interaction between lifetime cigarette and marijuana use was observed for receiving oral sex: those who had a lifetime history of both cigarette and marijuana use first received oral sex at a younger age as compared to those who only had used only cigarettes or marijuana.

Multivariate linear models for anal intercourse did not yield any significant associations, other than those between race/ethnicity and gender described in Table II.

DISCUSSION

The first aim of our study was to identify the kinds and age of onset of sexual behaviors in adolescents. Almost 14% of our sample of young adults reported onset of sexual intercourse before age 13. These findings are higher than that of the 1995 YRBS Report, which reported that 9.0% of high school students had sexual intercourse before age 13 (Centers for Disease Control and Prevention, 1996). Because adolescents may be at increased risk for sexually transmitted diseases due to a variety of reasons, including barriers to condom use (Crosby et al., 2003), and perceptions of low personal risk for infection (Bettinger, Adler, Curriero, & Ellen, 2004), the finding that almost 42% had vaginal intercourse by age 14 (approximately 9th grade) is concerning. This rate is higher than that found in the YRBS in 1995, which

reported that 36.9% of 9th graders had ever had sexual intercourse (Centers for Disease Control and Prevention, 1996). Recently, analyses from the YRBS have suggested that the prevalence of sexual intercourse has decreased among U.S. high school students (Centers for Disease Control and Prevention, 2002a). While we were not able to examine temporal trends across age cohorts, we can conclude that the prevalence of sexual behaviors in this population is higher than that reported for the general U.S. population.

It is also clear that urban young adults engage in a variety of sexual behaviors beyond vaginal intercourse. Almost all of the young adults in this sample reported having vaginal intercourse at least once in their lifetime. A history of oral sex was also common, while anal intercourse was reported less frequently.

One implication of these findings is that abstinence-based sexuality education programs in high schools may not engage these youth, as abstinence may no longer be a relevant consideration and that sexuality education should start earlier. Adolescents require comprehensive sexuality education that includes information about using condoms for disease prevention across a range of sexual behaviors and using birth control for pregnancy prevention.

The second aim of this study was to investigate factors associated with early initiation of vaginal and oral sex among young adults in Baltimore. Similar to other studies, men (Brooks-Gunn & Furstenberg, Jr., 1989; Centers for Disease Control and Prevention, 2000; Mott et al., 1996; Mott & Haurin, 1988; Schwartz, 1999) and those who reported being forced to have sex initiated vaginal intercourse at an earlier age (Fergusson, Horwood, & Lynskey, 1997). Unlike previous studies of sexual intercourse among young adults, income and parental education were not independent predictors of sexual behavior in the final multivariate models (Miller et al., 1997; Santelli, Lowry, Brener, & Robin, 2000; Singh & Darroch, 1999; Wyatt, Durvasula, Guthrie, LeFranc, & Forge, 1999). One explanation for this lack of association may be the lack of variation in parental income; the majority (70%) of the study population was economically disadvantaged.

An important line of inquiry was the relation between age of the first vaginal sex partner as it relates to initiation. The majority (80.8%) of young adults in this sample had a first vaginal sex partner who was about the same age as they were, while 18.5% had a partner who was five or more years older. As seen in previous studies (Miller et al., 1997), initiating sex with an older sexual partner was associated with a younger age at vaginal sex initiation. We observed important interactions for this relationship by gender and race/ethnicity. Regarding gender, in the

final model, men who initiated vaginal sex with an older female partner were approximately 13.2 months younger than men who initiated vaginal sex with a female partner the same age or younger, whereas women who initiated vaginal sex with an older male partner were approximately 1.2 months younger than women who initiated vaginal sex with a male partner the same age or younger. Previous work has focused on adolescent women having sex with older men, but these results suggest that young men having sex with older women are at increased risk of early sexual behavior (Begley et al., 2003; DiClemente et al., 2002; Kaestle et al., 2002; Sturdevant et al., 2001). In terms of race/ethnicity, Black young adults who initiated vaginal sex with older partners had the youngest age at initiation, followed by Blacks with partners the same age or younger, Whites with older partners, and Whites with partners the same age or younger. The extent to which these partnerships with older people represent forced or coerced interactions cannot be determined from our data. As such, further investigation is needed to understand these associations.

We observed other significant differences between Black and White young adults. Similar to previous studies (Coutlée et al., 1997; Mott et al., 1996; Paul et al., 2000), Blacks were more likely to have vaginal intercourse and have it at an earlier age. Blacks were also significantly less likely to report performing oral sex. Our rates of receiving and performing oral sex among men were similar to the findings of the National Study of Men (Billy et al., 1993). Interestingly, White men and women were more likely to have first performed oral sex at a younger age, with women being significantly more likely to first perform oral sex at a younger age, after adjusting for forced sex, lifetime marijuana use, and lifetime history of having a same-sex partner. The reason for these differences is unclear. One explanation may be cultural differences in the acceptability of specific sexual behaviors. For example, it has been suggested that in the Black culture oral sex has traditionally been less acceptable (Staples, 1973; Wilson, 1986). Others have suggested that there are fewer biases towards early sexual intercourse among Blacks (Marsiglio & Menaghan, 1990).

It is important to note the association between sexual initiation of vaginal and oral sex with substance abuse and adolescents' educational attainment. This finding suggests that there may be groups of students who are at high risk for a cluster of poor outcomes and that it might be useful for sexuality education and substance use education to be taught, quite deliberately in tandem, with the common risks emphasized.

Our findings should be considered with several limitations in mind. One-fourth (25.8%) of the original

first grade cohort did not complete the young adult follow-up interview. Women, Blacks, and those whose parents had at least a high school education were significantly more likely to have been interviewed at follow-up. Our results may be biased if follow-up was differential in terms of sexual behaviors (i.e., those who initiated sexual behaviors earlier were less likely to return for follow-up).

The age at which forced sex occurred was not asked, and the phrasing of the question left the meaning open to interpretation by respondents. It is possible that the initiation of sexual behavior could have occurred after an episode of forced sex or that the first episode of vaginal intercourse was forced. Despite this issue of temporality, we included this variable in the model because of the significant impact such an event is known to have on subsequent sexual behaviors (Bartholow et al., 1994; Fergusson et al., 1997; Lodico & DiClemente, 1994; Wilsnack, Vogeltanz, Klassen, & Harris, 1997). A separate analysis conducted without the forced sex variable yielded similar findings.

Since some of the risk behaviors we studied are highly sensitive and stigmatized (e.g., having a same sex partner or heterosexual anal sex), they may be underreported, which would tend to bias our risk estimates towards the null. On the other hand, it is important to note that telephone interviews have been found to give comparable information to face-to-face interviews (Weeks, Kulka, Lessler, & Whitmore, 1983), and specifically for sexual behaviors (Jeannin, Konings, Dubois-Arber, Landert, & Van Melle, 1998). Furthermore, telephone interviews have been shown to reduce socially desirable reporting of sensitive data (Pless & Miller, 1979).

A strength of this study was our unique opportunity to study a community-based sample of White and Black economically disadvantaged public school students. Although national probability studies like the YRBS provide critical information on the rates of risk behaviors and unmet health service need in the U.S. population as a whole, national probability studies are less informative when it comes to understanding the risk behaviors among subgroups within the larger population. This is particularly true for economically disadvantaged populations living in large urban areas.

The data presented here represent a descriptive analysis of adolescent and young adult sexual behavior. Although we have focused on the prevalence of vaginal and anal intercourse and oral sex, along with their respective ages of onset, these findings have important implications in the design and development of programs aimed at reducing sexual risk-taking among adolescents. Understanding the age of onset of a variety of sexual behaviors can help target groups for early sex education

and preventive interventions aimed at reducing infectious diseases and unintended pregnancies, as well as guide development of appropriate programs to reduce risky sexual behaviors such as promoting consistent condom use. Our data demonstrate that education and intervention programs should not only focus on vaginal intercourse, but also on anal intercourse and oral sex and their unintended consequences. Furthermore, beginning abstinence only education in high school may be inappropriate given that the median age of onset for vaginal sex was 14.8 years. By high school, when many of these adolescents are already having sex, information about other forms of safer sex (e.g., the appropriate use of condoms and condom negotiation) is crucial for their sexual health. The racial/ethnic differences that we observed in sexual behaviors among this population demonstrate the importance of culturally appropriate and sensitive programs, particularly in schools which have a racially/ethnically diverse population. Finally, there may be benefit to combining sexually education with substance use education given the association between these risky behaviors and the well-established association of each with poor school outcomes.

Future studies are needed to describe adolescent sexuality and its developmental trajectories. In particular, it will be important to determine whether the racial/ethnic differences we observed in the onset of oral and vaginal sex are observed in other samples and what the underlying reasons are for such differences. Understanding demographic correlates and behavioral precursors to early sexual initiation can help target groups for early intervention and guide development and expansion of appropriate programs to reduce risky sexual behaviors such as unprotected sex.

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