

The Prevalence, Frequency and Social Ecology of Sexual Concurrency Among Young Adult Women

CONTEXT: Sexual concurrency among women is associated with increased risks of STD transmission, unintended pregnancy and sexual health disparities. Understanding the prevalence of concurrency—overlapping sexual partnerships—is imperative to reducing these disparities.

METHODS: Weekly, population-representative panel data from 757 women aged 18–22, collected from 2008 to 2012 in Michigan, were drawn from the Relationship Dynamics and Social Life study. Univariate analyses assessed the prevalence of two forms of sexual concurrency. Multivariate logistic regression models investigated associations between women's social-ecological characteristics and concurrency.

RESULTS: Twenty percent of women had vaginal intercourse with two partners in one week; 14% had intercourse with a second partner during an ongoing relationship. In both cases, the majority of individuals had intercourse with the second partner in one to three weeks in total. The likelihood of both types of concurrency was elevated among women who believed they should have sex with men after seeing them for a while (log-odds, 0.27 and 0.23, respectively) and among those who were Black (0.58 and 1.02, respectively); the likelihood was reduced among women who were more willing to refuse unwanted sex (–0.10 and –0.13, respectively) and who were in exclusive, cohabiting, or married or engaged relationships (–1.82 to –2.64). Having intercourse with multiple partners in one week was also associated with receiving sex education from parents, the degree that parents and friends approved of sex, and having had early intercourse without contraception.

CONCLUSIONS: Sexual concurrency among young women is prevalent but intermittent, and interventions that address individuals' social-ecological contexts are needed to reduce negative health outcomes.

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Sexual concurrency—having overlapping sexual partnerships—is associated with an elevated risk of STDs,^{1–5} in large part because it can connect healthy individuals to potentially infected ones through a mutual partner.^{6,7} When someone has sex with multiple partners in quick succession, it further compounds the risk of STD transmission by reducing the time that a person has between partners to become symptomatic and to get tested or treated.⁸ Moreover, individuals who engage in concurrency are more likely to engage in a range of risk-taking behaviors, including sex without condoms and substance use, that also increase the risk of STD transmission and unintended pregnancy.^{9,10} Thus, understanding who is most likely to be concurrent and under what circumstances they are most likely to be so is central to comprehending the etiology of STDs.

Because incidence rates of STDs and unintended pregnancy are highest during the transition to adulthood,^{11–13} expanding our knowledge of sexual concurrency among young women is especially important. Few studies have examined concurrency among women specifically, and among those that have, most aggregate women from a wide age range.^{3,10,14–16} At least two studies, however, have indicated that concurrency is more common at younger ages,^{10,17} highlighting the need for research on the topic among young adults. Further, because previous studies

have largely relied on cross-sectional data,^{10,15,18} scholars have rarely been able to identify when intercourse with both partners occurred in a narrow time frame or how the likelihood of concurrency varies within women's changing social ecology—meaning the combination of their sexual ideation, or developing thoughts about sexuality, and their broader social environment.

Our study advances existing research by using panel data collected at one-week intervals to estimate the prevalence and frequency of concurrency among young adult women and to investigate its relationship to women's dynamic social-ecological characteristics. Using repeated, weekly observations about sexual activity and relationships, we assess and compare two types of concurrency: one-week time frames in which women had penile-vaginal intercourse with two or more partners, and instances in which women were in an ongoing heterosexual relationship and had penile-vaginal intercourse with at least one other person in the middle of that relationship.

Measurement of Sexual Concurrency

With a few exceptions,^{9,19} most research on concurrency in the United States has relied on cross-sectional data in which respondents are asked to identify the first and last time they had intercourse with each of their recent partners,^{10,20–22} to

report additional people they had intercourse with while in their most recent relationship,^{21–24} or to make clear whether they are currently in multiple, ongoing relationships.²⁰ None of these approaches identifies how close in time a person had sex with each partner—an important piece of information that affects the risk of STD transmission.⁸ Moreover, because they rely on respondents' memory, the first two approaches can suffer from underreporting.^{21,22,25}

Relying on cross-sectional data or information collected at infrequent intervals^{18,26,27} also prevents estimations of how the likelihood of concurrency varies with the ebb and flow of various facets of women's lives. Yet, like young women's sexual desires, attitudes and agency,^{28–30} women's sexual behaviors³¹—including concurrency—may change as they progress through romantic relationships, acquire new friends or enter new educational settings. For instance, as young women transition to adulthood and an increasing proportion of their friends become sexually active, their own desire for sex increases as well.²⁸ At the same time, their willingness to refuse unwanted sex typically declines during this time.³⁰ These changes in young women's feelings about and anticipation of sex may be related to changes in their likelihood of having concurrent sexual partners during this transitional period of the life course.

Theoretical Framework

Although data are limited, research indicates that 6–8% of women of reproductive age in the United States engage in concurrent relationships.¹⁰ However, given the frequency of sexual experimentation that occurs during adolescence and early adulthood,³² concurrency may be more common during adolescence and the transition to adulthood than at later stages of the life course.^{10,17}

Women more often report having concurrent partners when they are in nonexclusive relationships or are not married than when they are married or in exclusive partnerships.^{10,24} One study, however, found that approximately half of concurrent incidents (where women have penile-vaginal intercourse with more than one person in a week's time) occur within exclusive relationships.⁹ This may be in part because women are more likely to have sex with secondary partners when they mistrust their primary partner or believe that he or she has already had sex with someone else.^{22,33} Other studies suggest that concurrency is more prevalent among women who had their sexual debut at an early age (during or before early adolescence),^{10,34} were abused as children¹⁷ or had experienced sexual coercion.¹⁷ Associations between sexual concurrency and past sexual experiences and abuse indicate that concurrency may be more common among women who lack sexual agency. This interpretation is supported by findings from qualitative research indicating that some women stay with partners who are nonmonogamous in an effort to maintain exclusive relationships,^{35,36} and that in some instances these women blame other women for their partners' extrarelationship sexual activity.³⁵

Associations between concurrency and a woman's past sexual history highlight the socially embedded nature of

concurrency. According to the social-ecological model of human development,³⁷ individuals' thoughts, feelings and behavior have a reciprocal relationship with their social surroundings. In this model, women's social ecology is seen as consisting of five mutually reinforcing layers: women themselves; their social networks; the organizational settings that facilitate network interactions; the broader community that these organizations belong to; and the overall social and structural environments. The social-ecological framework suggests that young women's likelihood of having concurrent relationships should be related to their personal perceptions of sex; the people whom they interact with the most, for example, partners, friends and family; sexual norms among those individuals; and the institutions they participate in, such as school and work.

Previous research has provided support for the value of this framework. In particular, studies have highlighted connections between young women's sexual attitudes and behavior and those of their family, friends and partners, as well as school and religious environments. For instance, one study found that the more comfortable adolescents are discussing sex with their parents, friends and partners, the more they intend to delay sexual activity—and correspondingly, the less likely they are to be sexually active.³⁸ Similarly, another study found that adolescent women are less likely to have sex when their parents speak with them about abstinence.³⁹

Studies of peer groups have found that women's condom use and risk of early pregnancy tend to mimic the norms among their friends and within their school settings.^{31,40,41} In fact, one study found that how much young women want to have sex depends on how many of their friends are sexually active.²⁸ Partners, too, play an important role in the sex lives of young women. Studies have shown that women's sexual activity is associated with the characteristics of their partners, for example, whether their partners are older and more sexually experienced.⁴²

Moreover, research has found that racial and socioeconomic differences in women's sexual and reproductive attitudes are often attributable to distinct social norms, neighborhood contexts and institutional memberships, as indicated by differences in religiosity and college enrollment.^{28,43–45} Nevertheless, numerous studies have found that, net of other factors, race is strongly correlated with sexual concurrency: Black women are more likely to have had concurrent relationships than women from other racial or ethnic backgrounds.^{10,15} Because interracial relationships are infrequent,⁴⁶ and thus sexual networks are racially segregated, higher rates of concurrency among Blacks may help to explain a higher prevalence of STDs among this group.⁴⁷

Of course, social ecologies evolve as a function of pivotal experiences that change individuals' thoughts and preferences over time.⁴⁸ For instance, early sexual experiences may be related to subsequent concurrency by influencing young women's ideas about what is "normal" or acceptable, their social mores and the perceived consequences of

their decisions. We expect—based on the social-ecological model, the limited body of research on female concurrency and general research on women's sexual and reproductive health—that young women's likelihood of having concurrent partnerships should vary with their sexual ideation (evolving attitudes and perceived agency); perceived norms among family and friends; previous sexual experiences; and select demographic characteristics, such as race and relationship commitment.

METHODS

Sample and Data Collection

We used data from the Relationship Dynamics and Social Life (RDSL) study, a population-representative weekly survey from 2008 to 2012 of young women who were 18 or 19 years old and residing in one Michigan county at baseline; women who were temporarily residing outside the county at the time of recruitment were also included. Participants were randomly selected from the Michigan Department of State Driver's License and State Identification Card database. There was an 84% response rate (94% of successfully located individuals).

Baseline data were collected in person on a rolling basis during 2008 and 2009. Respondents were given \$20 for taking the baseline survey, which assessed a wide range of psychosocial and behavioral characteristics related to sexual and reproductive health. These included respondents' sociodemographic background; sexual and reproductive history; and reproductive attitudes, agency and perceived norms.

After baseline data were collected, respondents were invited to participate in the weekly journal portion of the study; it took about five minutes to complete each weekly report online or over the phone. Questions in these journals asked respondents about their relationship status, penile-vaginal intercourse and contraceptive use. Every 12 weeks, questions also reassessed time-varying demographics (such as school enrollment), sexual ideation and perceived norms. Respondents were paid \$1 for every completed journal and \$5 for every five journals consecutively completed on time. Seventy-eight percent of respondents completed journals for at least 1.5 years, while 63% completed journals for 2.5 years.⁴⁹ An experiment conducted in tandem with the RDSL confirmed that repeatedly completing journals had little influence over respondents' attitudes or behavior. In the companion study, a second group of women were asked to complete the baseline questionnaire and then complete a journal one year later: Changes in behavior and attitudes were similar for the RDSL sample and this second group.⁵⁰

Missing data were rare; only 3% of item-specific data were missing.⁴⁹ Moreover, missing data in weekly journals appeared to be random—women typically did not skip multiple questions in the same week, and the same women did not repeatedly omit responses to the same questions across weeks. To retain weeks with missing information on time-varying predictors, we therefore replaced missing values with the value a woman had most recently reported. In a sensitivity analysis, reestimating our models using

listwise deletion yielded substantively similar results (available upon request).

We limited all analyses to women who were ever sexually active during the study and who completed two or more journals. From these women, we created two analytic samples. These samples were not mutually exclusive because a woman could engage in both types of concurrency. The first comprised weeks (journals) when respondents reported having sex (19,669 weeks from 757 women). This allowed us to assess which characteristics might be associated with a woman having sex with more than one person, compared with having sex with only one person, in a given week. The second analytic sample comprised weeks when respondents were in a sexually active relationship, and more specifically, were in the “middle” of that relationship (e.g., not in its first or final week; 21,244 weeks from 638 women). This enabled us to assess which characteristics were associated with a woman having sex with a secondary partner before she stopped having sex with her primary partner (what some refer to as “embedded” concurrency).⁵¹

Measures

•**Sexual concurrency.** Respondents were asked to provide their primary partner's initials for each week they reported being in a relationship. They were then asked whether they had vaginal intercourse with that partner that week. This allowed us to identify all primary relationships that were sexually active, and to specifically identify when the respondent first and last had sex with her primary partner. In weeks when respondents reported being in a relationship, they were also asked whether they had vaginal intercourse “with anyone other than [primary partner's initials].” This additional information enabled us to create two measures of concurrency. The first indicates whether a woman had sex with two or more people in a given week, meaning whether she reported intercourse with her primary partner and with somebody else that week, compared with having intercourse with one person only (either her primary partner or somebody else). The second indicates embedded concurrency—when a woman reported that she had intercourse with anyone other than her primary partner, specifically in a week that fell between the first and last weeks she had sex with her primary partner.

•**Sexual ideation.** The sexual ideation measure, which was updated every 12 weeks, consisted of respondents' sexual attitudes, self-efficacy and perceived agency. Attitude was assessed by asking respondents whether they believed that a woman “who has been seeing a guy for a while should have sex with him”; possible responses ranged from “strongly disagree” (1) to “strongly agree” (5). Self-efficacy was assessed by asking respondents what the chances are, on a scale of 0 to 100, that they would be able to stop themselves from having sex once aroused. For ease of interpretation, we divided the responses by 10. Agency was measured by asking how willing respondents would be to refuse unwanted sex even if it made their partner angry; responses ranged from “not at all” (0) to “extremely” (5).

•**Norms.** The assessment of social norms included four indicators. The first was how much informal sex education respondents had received from their parents. This was measured with an index, ranging from 0 to 5, that summed affirmative responses to questions about whether a respondent's parents had ever spoken to her about how to say no to sex, what methods of birth control exist, where to get birth control, how to prevent STDs and how to use condoms. The second and third norms were how positively her parents and friends (separately) would react if they found out she was having sex, ranging from "not at all" (0) to "extremely" (5). The fourth norm was the proportion of respondents' friends who were sexually active, with responses ranging from "none" (1) to "almost all" (5). Perceptions of approval and of sexual activity among friends were reassessed every 12 weeks.

•**Institutional membership.** We considered two types of institutional membership—educational and religious. Education was defined as whether a respondent was currently attending a two- or four-year college; this was updated every 12 weeks. Because 95% of respondents reported belonging to a Christian denomination or having no religion, we categorized religion into two groups: whether respondents reported being highly religious, meaning that religion was either "very important" or "more important than anything else," as opposed to it being "somewhat" or "not important." Religiosity was assessed only at baseline.

•**Sexual behavior risks.** These risks included behaviors associated with early pregnancy and STD transmission, namely, whether a respondent had their first sexual intercourse at age 14 or younger and whether she had ever had sexual intercourse without contraception before baseline.

•**Respondent and partner demographics.** We assessed five demographic characteristics. These included respondents' age and parity (cumulative number of births to date, including those before baseline), which were updated weekly; and whether her mother had graduated college, whether she had grown up in a two-parent home, and her race, each of which was measured once at baseline. Race was dichotomized as to whether a woman self-identified as Black. We focused on being Black because 97% of respondents identified as either Black or White. Partners' demographics, which were reported by respondents only about their primary partners, included whether they had ever attended college and their age. We did not control for partners' race because this is highly correlated with respondents' race. Finally, we also controlled for the respondent and her partner's current relationship status, categorized as nonexclusive, exclusive, cohabiting, or married or engaged.

Analysis

We separately calculated the proportion of respondents who ever had sex with two partners in the same week and those who ever had sex with a second partner in the middle of an ongoing sexual relationship. Then, among each category of women, we tabulated how many weeks they were concurrent (according to each definition). We used

descriptive statistics to explore ideation, norms, membership, behavior and demographic variables for our two subsamples of women and the weeks they were concurrent.

Next, we assessed the social-ecological correlates of concurrency using logistic regressions with random effects. This means that coefficients for time-invariant indicators, such as race, convey average differences in the log-odds of concurrency across respondents over the course of the study. Coefficients for time-varying indicators like education, however, were simultaneously derived from the estimated difference in the log-odds of concurrency across respondents with and without that experience (e.g., between those who were or were not enrolled in college in a given week) and the estimated difference in the log-odds of concurrency as respondents moved into or out of that experience (e.g., between when the same woman was or was not enrolled in college). First, we estimated a model calculating a woman's odds of having sex with two or more partners in a given week, compared with when she was having sex with one partner only. Then, we estimated a similar model calculating a woman's odds of having sex with a secondary partner in weeks when she was in the middle of an ongoing, primary sexual relationship, compared with when she was not in such a relationship.

Because the RDSL consists of a simple random sample, no survey weights were used. All analyses were conducted in Stata version 15.

RESULTS

Sample Characteristics

Sexual ideation, norms, institutional environments, sexual histories and demographic backgrounds were similar across both analytic samples (Table 1). This suggests that sample compositional differences should not drive any variation in how these measures correlate with the two forms of concurrency in the multivariate analysis. We limit our discussion of descriptive statistics to the sample used to assess the likelihood of having two or more partners in the same week (sample 1). When discussing time-variant characteristics, we describe the sample of weeks; when discussing time-invariant characteristics, we refer to the sample of women.

In an average week, respondents did not have strong beliefs that a woman should have sex with a male partner after seeing him for a while—a score of 1.9 out of 5. Nevertheless, respondents' perceived ability to stop themselves from having sex once aroused (6.9 out of 10) and perceived willingness to stop their partners from having sex with them when they didn't want to (3.8 out of 5) were only moderate.

Respondents reported receiving moderate levels of informal sex education from their parents, who discussed an average of three out of five topics. In a typical week, women expected their parents to react only somewhat positively, and their friends to react somewhat more positively, if they found out that she was having sex; scores were 2.2 and 3.3, respectively (out of 5). Women perceived that the majority of their friends were sexually active, scoring an average of 4.5 out of 5 on this scale, or between "most" and "almost all," in a given week.

TABLE 1. Selected characteristics of young women aged 18–22 and their partners, Relationship Dynamics and Social Life study, Michigan, 2008–2012

Characteristic	Sample 1: Two partners in same week		Sample 2: Second partner during ongoing relationship	
	Weeks (N=19,669)	Women (N=757)	Weeks (N=21,244)	Women (N=638)
Sexual ideation†				
Should have sex with a man after seeing him a while (range, 1–5)	1.87 (0.68)	1.88 (0.60)	1.84 (0.66)	1.86 (0.59)
Perceived ability to stop herself once aroused (range, 0–10)	6.90 (3.02)	7.68 (2.81)	7.02 (2.97)	7.69 (2.78)
Willingness to refuse unwanted sex (range, 0–5)	3.81 (1.57)	4.05 (1.61)	3.82 (1.54)	4.12 (1.54)
Norms†				
Informal sex education from parents (range, 0–5)	3.01 (1.16)	2.99 (1.79)	3.01 (1.72)	3.02 (1.77)
Parents' approval of sex (range, 0–5)	2.21 (1.27)	1.70 (1.48)	2.23 (1.26)	1.66 (1.45)
Friends' approval of sex (range, 0–5)	3.27 (1.16)	2.86 (1.41)	3.27 (1.13)	2.86 (1.40)
Proportion of friends sexually active (range, 1–5)	4.52 (0.84)	4.36 (1.00)	4.48 (0.86)	4.38 (0.99)
Institutional membership				
Enrolled in college†				
Yes	55	48	57	49
No	45	52	43	51
Highly religious				
Yes	50	55	48	55
No	50	45	52	45
Sexual behavior risks				
Debut at ≤14 years				
Yes	20	19	18	19
No	80	81	82	81
Had sex without contraception before baseline				
Yes	54	55	51	5
No	46	45	49	45
Demographics				
<i>Respondent</i>				
Parity†	0.22 (0.50)	0.18 (0.45)	0.22 (0.50)	0.18 (0.46)
Age†	20.30 (0.93)	19.18 (0.57)	20.35 (0.92)	19.18 (0.57)
Mother graduated college				
Yes	23	20	24	22
No	77	80	76	78
Grew up with two parents				
Yes	58	52	61	53
No	42	48	39	47
Black				
Yes	22	34	19	31
No	78	66	81	69
<i>Partner</i>				
Had some college education				
Yes	49	na	51	na
No	51	na	49	na
Age	22.80 (4.05)	na	22.77 (3.96)	na
Couple's relationship status				
Nonexclusive	9	na	4	na
Exclusive	46	na	48	na
Cohabiting	21	na	22	na
Married/engaged	24	na	26	na

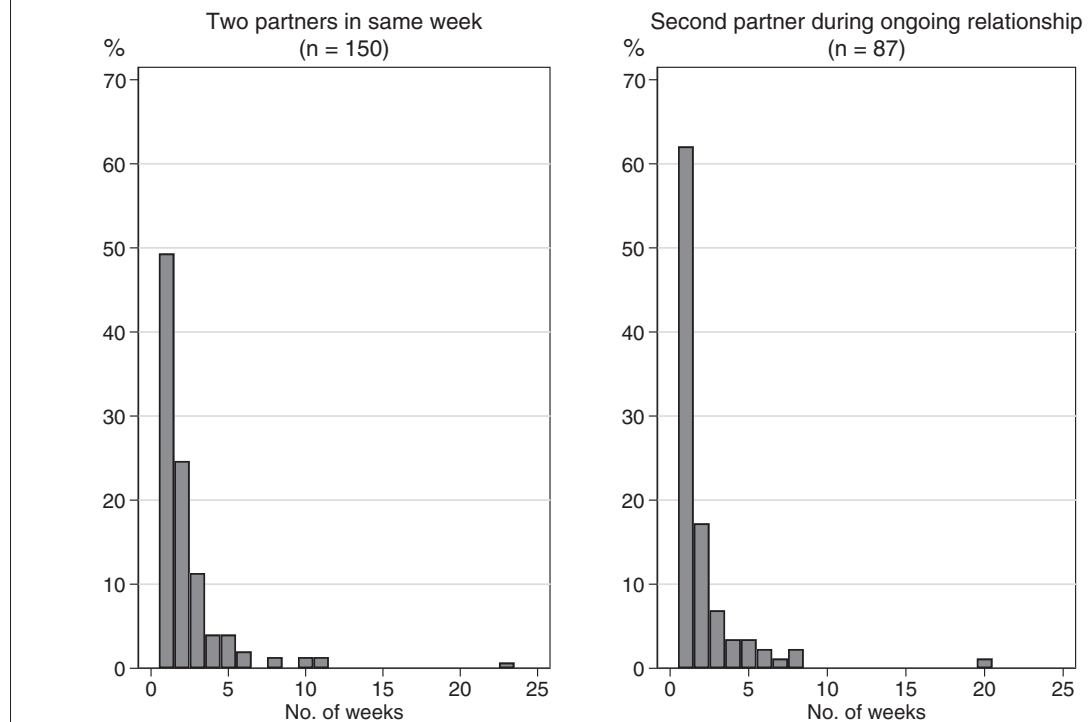
†When describing the samples of women, descriptive statistics pertain to baseline measurement. Notes: Figures in parentheses are standard deviations. na=not applicable.

In 55% of weeks, respondents were enrolled in either a two- or four-year college. More than half of the respondents—55%—were highly religious. In terms of history of sexual behavior risks at baseline, 19% of respondents had their sexual debut by age 14, and 55% had ever had sex without contraception.

The two analytic samples were also similar regarding respondents' and their partners' demographic characteristics. In an average week, respondents had a mean parity of 0.2, and were

20 years and 4 months old. One-fifth of respondents' mothers had graduated college, while slightly more than half of respondents—52%—had grown up in a two-parent household. A third of respondents were Black. In about half of all weeks, respondents' partners had at least some college education. On average, partners were two and a half years older than respondents, with a mean age of 22 years and 10 months.

In both analytic samples, the most common type of relationship was exclusive (46% of weeks in the first sample

FIGURE 1. Frequency of two types of sexual concurrency among ever-concurrent women

and 48% of weeks in the second). Nonexclusive relationships, however, were more than twice as common in sample 1 as in sample 2 (9% vs. 4% of weeks). Conversely, the proportions of relationships that were cohabiting and married or engaged were slightly higher in the second sample. These cross-sample differences reflect the fact that the second analytic sample was limited to weeks when women were in the middle of relationships that were sexually active for at least three weeks, and more serious relationships were more likely to meet this criterion.

Descriptive Findings

Twenty percent of sexually active women (150 of 757) reported ever having had intercourse with two or more partners in the same week.* Of these women, 49% had vaginal intercourse with two or more partners in one week only; 25% in two weeks; and 11% in three weeks (Figure 1). Thus, concurrency of this type was prevalent among women but infrequent across time.

Fourteen percent of sexually active women who were ever in a relationship that was three weeks or longer (87 of 638) reported having had intercourse with a nonprimary partner while in an ongoing sexual relationship.† Among these women, 62% had intercourse with a nonprimary partner in the middle of their sexually active primary

relationship in just one week; 17% in two weeks; and 7% in three weeks. Embedded concurrency was thus also prevalent but infrequent.

There was substantial overlap between the two types of concurrency. In 40% of weeks when women had sex with two or more partners, they did so in the middle of an ongoing primary sexual relationship (not shown). In the remaining 60% of weeks, the concurrency did not occur in the middle of an ongoing relationship, either because the primary relationship was brief (less than three weeks) or because they had sex with a second partner in either the first or last week of that relationship. In 76% of weeks when women had sex with a secondary partner during an ongoing sexual relationship, they had sex with both their secondary and primary partners in the same week.

Multivariate Findings

For each additional point that a respondent more strongly believed that a woman should have sex with a man after seeing him for a while, her log-odds of having had sex with two or more people in the same week increased by 0.27; similarly, her log-odds of having had sex with a second partner in the middle of a primary sexual relationship increased by 0.23 (Table 2). Women's log-odds of both forms of concurrency did not vary with their perceived ability to stop themselves from having sex once aroused. However, for each additional point a respondent thought she would be willing to refuse unwanted sex even if it made her partner angry, her log-odds of having had sex with two or more partners that week, compared with one person only, decreased by 0.10. Similarly, for each

*Thirteen percent of women who participated for at least a year had sex with two or more people in the same week during the initial year.

†Eight percent of women who stayed in the study for at least a year had sex with a nonprimary partner in the middle of an ongoing relationship during the initial year.

additional point a woman thought she would be willing to refuse unwanted sex, her log-odds of having had sex with a secondary partner in the middle of her primary relationship decreased by 0.13.

Regarding women's perceived social norms, having received sex education from parents and perceived parental approval of sexual activity were both negatively associated with having had sex with two or more people in the same week. Specifically, for each additional topic a woman's parents discussed with her, her log-odds of having had sex with multiple partners in a given week decreased by 0.15; for each one-point increase in parental approval of sex, her log-odds declined by 0.10. However, neither of these measures was associated with women having sex with a second partner during an ongoing sexual relationship. In contrast, for each one-unit increase in friends' perceived approval of sex, women's odds of having had sex with two or more people in the same week increased by 0.13. This measure was not associated with the other concurrency outcome. Respondents' perception of the proportion of friends who were sexually active was not associated with either form of concurrency.

With respect to women's institutional memberships, concurrency did not differ by college enrollment or religiosity. We found no associations between sexual debut and either form of concurrency; however, women who had had sex without contraception before baseline had elevated log-odds of having had sex with two or more partners in the same week (0.82).

In both samples, we found few differences in the odds of concurrency occurring according to respondents' demographic characteristics. Compared with peers who were not Black, Black respondents had higher log-odds of reporting both forms of concurrency (0.58 and 1.02, respectively). Few differences were observed across partners' demographic characteristics, with the exception that a partner's age was positively associated with a woman's log-odds of having had sex with a secondary partner while in a primary relationship (0.06). Finally, women's log-odds of engaging in either type of concurrency were lowest when they were in exclusive, cohabiting, married or engaged relationships, monotonically decreasing with commitment level (-1.82 to -2.64).

DISCUSSION

Sexual concurrency is associated with unwanted sexual and reproductive health outcomes and plays an important role in STD transmission.¹⁻⁵ Our analysis of population-representative data indicated that, during the transition to adulthood, one in five sexually active young women have sex with two or more people in the same week, while roughly one in seven have sex with someone other than their primary partner in the middle of an ongoing relationship. Overlap between the two types of concurrency indicates that when young women have sexually concurrent partners, there is often insufficient time for them to develop STD symptoms or get tested. Yet when women are sexually

TABLE 2. Log-odds (and 95% confidence intervals) from logistic regression models with random effects examining associations between social-ecological characteristics and two types of sexual concurrency

Characteristic	Model 1: Two partners in same week	Model 2: Second partner during ongoing relationship
Sexual ideation		
Should have sex with a man after seeing him a while	0.27 (0.08–0.45)***	0.23 (0.00–0.46)*
Perceived ability to stop herself once aroused	0.03 (-0.02 to 0.07)	0.02 (-0.05 to 0.10)
Willingness to refuse unwanted sex	-0.10 (-0.20 to -0.01)**	-0.13 (-0.28 to 0.02)*
Norms		
Informal sex education from parents	-0.15 (-0.26 to -0.04)***	-0.09 (-0.24 to 0.06)
Parents' approval of sex	-0.10 (-0.22 to 0.02)*	-0.06 (-0.22 to 0.10)
Friends' approval of sex	0.13 (-0.01 to 0.27)*	0.16 (-0.04 to 0.37)
Proportion of friends sexually active	-0.14 (-0.35 to 0.08)	0.09 (-0.21 to 0.40)
Institutional membership		
Enrolled in college	0.17 (-0.17 to 0.51)	0.35 (-0.11 to 0.80)
Highly religious	-0.18 (-0.63 to 0.27)	0.07 (-0.53 to 0.67)
Sexual behavior risks		
Debut at ≤14 years	-0.08 (-0.63 to 0.47)	0.09 (-0.69 to 0.86)
Had sex without contraception before baseline	0.82 (0.35–1.29)***	0.47 (-0.19 to 1.13)
Demographics		
<i>Respondent</i>		
Parity	-0.13 (-0.51 to 0.25)	-0.18 (-0.71 to 0.36)
Age	0.01 (-0.21 to 0.24)	-0.10 (-0.45 to 0.26)
Mother graduated college	-0.33 (-0.91 to 0.24)	-0.05 (-0.88 to 0.78)
Grew up with two parents	-0.14 (-0.59 to 0.30)	-0.28 (-0.93 to 0.37)
Black	0.58 (0.05–1.11)**	1.02 (0.32–1.71)***
<i>Partner</i>		
Had some college education	-0.07 (-0.52 to 0.37)	-0.12 (-0.74 to 0.50)
Age	0.02 (-0.04 to 0.07)	0.06 (-0.01 to 0.12)*
<i>Couple's relationship status</i>		
Nonexclusive (ref)	1.00	1.00
Exclusive	-1.87 (-2.22 to -1.51)***	-1.82 (-2.52 to -1.12)***
Cohabiting	-2.15 (-2.72 to -1.58)***	-1.82 (-2.58 to -1.07)***
Married/engaged	-2.64 (-3.28 to -1.99)***	-2.21 (-3.22 to -1.20)***
<i>Constant</i>	-3.99 (-8.65 to 0.67)*	-5.08 (-12.14 to 1.98)

*p<.05. **p<.01. ***p<.001. Note: ref=reference group.

concurrent, no matter how it is defined, they tend to have sex with a second partner for only one to three weeks in total.

Both types of concurrency are connected to women's sexual ideation. Those who view sex as nonobligatory within relationships or who feel that they would be willing to refuse unwanted sex have a reduced likelihood of engaging in concurrency. While qualitative research has suggested that some women tolerate their partners being concurrent even when they do not want them to be^{35,36}—suggesting that men's concurrency is associated with women's lack of agency within relationships—our findings indicate that women's lack of sexual agency and perceptions that they are not entitled to such agency are also associated with their own concurrency.

In addition, when defined as sex with two or more partners in the same week, concurrency is associated with sexual norms within women's families, a key source of education and socialization during childhood and adolescence. Women who receive more sex education from their parents—including information about topics such as how to refuse unwanted sex—and those whose parents are more

approving of sex are less likely to have sex with multiple people in the same week. Such women are no more or less likely than their peers, however, to have sex with a secondary partner while in an ongoing relationship. Therefore, parents' communication about sex may contribute to young adults' perceptions of the risks associated with different sexual scenarios, leading them to be more cautious of having sex with multiple people in quick succession but not necessarily of having sex with secondary partners over a longer time period. In contrast to parents' approval, friends' approval of sex is associated with an increased likelihood that women will have sex with more than one person in a one-week time frame. This highlights the value of taking a social-ecological approach to understanding sexual concurrency during young people's transition to adulthood, which often includes weakening ties to family members and strengthening connections to peers.

Notably, neither form of concurrency was associated with young women's institutional memberships. Research on "hook-ups" indicates that casual sexual encounters are quite common among college students.^{52,53} Although sex with secondary partners is not necessarily casual, this study's findings suggest that having sex with two or more people in the same week is no more or less common among college students than among their nonenrolled peers. Moreover, a young woman's earlier history of having had sex without contraception was one of the characteristics most strongly associated with having sex with multiple partners in the same week. As other studies have shown,⁹ sexual concurrency is part of a broader pattern of sexual risk-taking that is often established early in the life course.^{10,34}

The two forms of concurrency did not differ much by demographic characteristics, with the exception of race. The associations between race and concurrency were some of the largest for each type. These findings corroborate past research, which found that concurrency is more prevalent among Blacks than among other racial and ethnic groups in the United States.^{10,15} Notably, associations between relationship status and concurrency were the largest for both types of concurrency, which is also consistent with past studies^{10,24} and highlights the protective role of exclusive, cohabiting, married or engaged relationships.

Limitations

Several limitations of our study are worth noting. First, although RDSL data are representative of a county that falls close to the national median on many demographic measures,³⁴ they are not nationally representative. Nevertheless, previous studies have found that the RDSL sample is similar to nationally representative samples of women of the same age with respect to reproductive behaviors related to sexual concurrency, such as nonmarital and teen childbearing.^{55,56} Second, the RDSL sample is limited to women aged 18–22, and we were therefore unable to compare the prevalence, frequency and social-ecological correlates of young adult women to those of young adult men or to those of adolescent or older women. Third, our estimates were based on

data that were collected approximately 10 years ago. Young women's behavior and ideation may have shifted over the interim.

Fourth, while we were able to identify sexual concurrency when it involved vaginal intercourse, we were unable to assess concurrency involving only anal or oral sex. Fifth, although we identified when a woman had intercourse with two or more people in the same week, we did not know whether her relationship with the secondary partner was ongoing. Finally, because we did not have information on drug and alcohol use, we were unable to assess how concurrency varies with substance use—an important relationship that others have documented.^{21,22,24} To the extent that substance use is correlated with women's sexual ideation, norms and early experiences, its omission may upwardly bias our multivariate findings.

Conclusions

Sexual concurrency is fairly common among women during the transition to adulthood, yet most individuals who engage in concurrent sex do so only intermittently. Our findings indicate that sexual concurrency is related to young women's sexual beliefs, norms and history, and to their relationships with friends, family and partners. Interventions aimed at reducing concurrency should use approaches, such as radio or television advertisements, that can simultaneously reach multiple aspects of women's social ecology. Reductions in the risks associated with concurrency, such as STD transmission, may be achieved by increasing consistent and effective condom use,⁹ either through similar media campaigns or through widespread provision of free condoms.

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