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The Effect of School Status and Academic Skills on the Reporting of Premarital Sexual Behavior: Evidence from a Longitudinal Study in Rural Malawi

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Abstract

Purpose—Reliable data on sexual behavior are needed to identify adolescents at risk of acquiring HIV or other sexually transmitted diseases, as well as unintended pregnancies. This study aims to investigate whether schooling status and literacy and numeracy skills affect adolescents' reports of premarital sex collected using audio computer-assisted self-interviews (ACASI).

Methods—Data on 2320 participants in the first three rounds of the Malawi Schooling and Adolescent Study were analyzed to estimate the level of inconsistency in reporting premarital sex among rural Malawian adolescents. Multivariate logistic regressions were used to examine the relationships between school status and academic skills and premarital sexual behavior reports.

Results—Males were more likely than females to report premarital sex at baseline while females were more likely than males to report sex inconsistently within and across rounds. School-going females and males were more likely to report never having had sex at baseline and to “retract” reports of ever having sex across rounds than their peers who had recently left school. School-going females were also more likely to report sex inconsistently at baseline. Literate and numerate respondents were less likely to report sex inconsistently at baseline; however, they were more likely to retract sex reports across rounds.

Conclusions—The level of inconsistency both within a survey round and across rounds reflects the difficulties in collecting reliable sexual behavior data from young people in settings such as rural Malawi, where education levels are low, and sex among school-going females is not socially accepted.

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Keywords

Adolescents; Sexual behavior; Inconsistency; ACASI; Longitudinal data; Education; Schooling; Literacy; Numeracy; Malawi; sub-Saharan Africa

Introduction

Although reliable survey data on sexual behavior are needed to identify adolescents at risk of acquiring HIV or other sexually transmitted diseases, as well as unintended pregnancies, information obtained from self-reports is subject to error due to respondents' inability to recall events correctly, social desirability bias, lack of motivation to respond accurately, and the misunderstanding of questions (1–3). A considerable body of research exists on the reliability and validity of adolescent reports of sexual behavior in the United States (4–7). These studies have found that a non-trivial proportion of adolescents —up to 12% in one study— retracted their initial reports of ever having had sexual intercourse in follow-up interviews. Research suggests that inconsistent reporting is an even greater problem in developing countries. In a survey of high-school students in South Africa, nearly 40% of adolescents who had reported sexual activity at an earlier assessment reported being virgins in a follow-up interview (2). In a study conducted among adolescents in Nairobi, 20% of respondents who reported sex in the first wave became “re-born virgins” in a subsequent wave (8). In a study in Jamaica that followed adolescents enrolled in seventh grade at baseline, 37% of respondents provided inconsistent reports over three rounds of data collection (9). Further, studies have also found that some respondents test positive for HIV and other sexually transmitted diseases despite claiming not to have initiated sex (10–13); however, the use of such biomarkers may not be a useful tool for validating self-reports of sexual activity in low prevalence communities (14). Results from these studies suggest that inconsistent reporting is not random and varies by respondent characteristics such as age, gender, education, and socioeconomic background.

While considerable research exists documenting the problematic nature of adolescent reports of sexual behavior (2,8,15–17), few studies have examined the determinants of misreporting among young people in sub-Saharan Africa including whether changes in schooling status may affect willingness to acknowledge premarital sex. Previous studies indicate that females enrolled in school are less likely to engage in premarital sex than their out-of-school peers (18,19) and that school attendance is associated with later age at first sex (20). These associations would also be observed, however, if schoolgirls were less willing to disclose ever having had sex than females who are no longer enrolled in school. Schoolgirls have a strong incentive not to report premarital sex if they perceive that by disclosing this information their schooling status would be jeopardized (21).

In this paper, we investigate the predictors of sexual behavior reports among rural Malawian adolescents, using data from the first three rounds of a longitudinal study of school quality and adolescent experiences. Unlike some other studies that have examined self-reported sexual behavior, we are able to explore consistency both within and across rounds. Moreover, we are able to investigate the extent to which literacy and numeracy skills, as well as changes in schooling status, are associated with the reporting of sex. The paper addresses the following questions: (i) Since sexual activity is proscribed for adolescents enrolled in school, particularly girls, are those attending school more likely to misreport premarital sexual behavior than their out-of-school peers? and (ii) Are adolescents with stronger academic skills more consistent in their reporting of premarital sexual behavior within and between survey rounds?

Methods

Sample

The data used in this paper come from the first three rounds of the Malawi Schooling and Adolescent Study (MSAS). The MSAS is a longitudinal study of 2,650 adolescents aged 14–16 at the beginning of 2007. The study is being conducted in Balaka and Machinga, two districts in the southern region of the country, the area most seriously affected by the HIV epidemic; it is estimated that nearly 18% of adults in the south are HIV positive (22).

Two-thirds of the MSAS respondents were students at primary schools visited during the second term of the 2007 school year. Thirty schools (representing nearly 20% of the schools in the district) were visited in Machinga, and 29 schools (nearly 25% of those in the district) were visited in Balaka. ^aThe probability of a particular school being included in the sample was proportional to its enrollment in 2006. ^bAt each school approximately 30 students stratified by gender and age and attending standards 4–8, the last four years of primary school, were randomly selected from registers recording enrollment at the beginning of the 2007 school year. According to the 2004 Malawi DHS, 76% of 14–16 year olds were still enrolled in school, of which 92% were enrolled in standards 4–8 (22). It is important to note that the MSAS did not collect data on adolescents who were enrolled in secondary school in the 2007 school year, thus our student sample is not fully representative of all 14–16 year old students.

The remaining third of the MSAS respondents in 2007 were adolescents who had not attended school in the second term of the school year. The out-of-school respondents were resident in randomly selected school catchment villages and were identified by head teachers, students, and community leaders. Follow-up interviews were conducted annually with 91% and 90% of the original sample re-interviewed in 2008 and 2009, respectively. The analysis in this paper focuses on all respondents who had never been married at baseline and for whom the relevant data are available: 80.8% of the original female sample and 94.4% of the original male sample. ^c

Procedure

The MSAS was approved by the Population Council Institutional Review Board and the University of Malawi Research and Publications Committee. Sensitization meetings with head teachers, teachers, and select community leaders took place prior to the study starting in a particular school. Passive parental consent was obtained prior to the initiation of fieldwork for the in-school sample. Teachers were provided a letter that was read out to selected classes and students were asked to inform their parents of their potential participation in the study. Participants were then asked to confirm their parent's consent prior to the start of the interview. For out-of-school participants, consent was first obtained from parents at the household, prior to assent being obtained from the participant. After providing assent, all study adolescents were interviewed using a structured survey questionnaire partially administered face-to-face with a trained enumerator, and partially administered via audio computer-assisted self-interview (ACASI).

^aThe original sample included 60 primary schools; however, one school in Balaka district could not be reached during fieldwork in 2007 because a bridge was washed away during the rainy season.

^bThe number of schools visited in each district was based on estimates of (i) the proportion of students in the age group attending primary school, (ii) estimated attendance rates, (iii) estimated attrition rates, (iv) estimates of transitions to secondary school and school dropout.

^cThe original sample includes 1338 females and 1312 males. We exclude from the analyses 168 females and 2 males who had already been married at baseline, 89 females and 70 males for whom the sexual behavior data are missing, and 1 male for whom other relevant data are missing.

The adolescent instrument includes an extensive set of questions on household and family characteristics, educational attainment, schooling history and experiences, household labor and employment, health, marriage, and sexual behavior. The survey also includes numeracy and literacy assessments. The sexual behavior section was conducted using ACASI, in which the respondent hears both the question and the response categories through headphones connected to a handheld computer. The respondent answers each question by selecting a number or color button on the computer screen associated with an audible response option. Respondents had a choice between two local languages for the interview: Chichewa or Chiyao. ^dMales listened to the recording of a male voice and females listened to a female voice. The advantage of ACASI over face-to-face interviews (FTFI) is that the respondent is afforded greater privacy and confidentiality when answering questions and interviewer influence is minimized.

Methodological studies conducted in Kenya (23) and in Zimbabwe (16) suggest that ACASI reduces social desirability bias, presumably generating more reliable sexual behavior data, although studies have also found that ACASI data are frequently more inconsistent than data generated through FTFI in which interviewers, whether instructed to do so or not, tend to reconcile responses that are internally discrepant (24).

Dependent variables

After listening to an explanation of what was meant by “sex”, ^e respondents were asked about their sexual experiences in two ways. First, they were asked their age at first sex; respondents who had never had sex were instructed to respond with the number zero. Next, all respondents (including those who entered “zero” in response to the first question) were asked whether they had ever had sex with a specific type of partner. ^f The partner types included: a boyfriend or girlfriend, a “hit and run” (someone with whom the respondent had a single sexual encounter), a relative, a teacher, and any other type of person not mentioned. Both the age-at-first-sex and sex-with-specific-partner questions were repeated in the first three rounds of the study. These questions were used to generate two types of dependent variables. First, to analyze consistency of baseline sexual behavior reports, we created a categorical variable indicating whether at baseline the respondent: (i) consistently reported never having had sex; (ii) consistently reported ever having had sex; or (iii) inconsistently reported sex. A respondent was classified as an inconsistent reporter if he or she gave an age at first sex but answered “no” to all the questions on sex with specific partners, *or* reported never having had sex in response to the age-at-first-sex question but reported having had sex with at least one type of partner. Second, to analyze consistency of sexual behavior reports across survey rounds, we created two indicator variables, one for each measure of sex (age at first sex and sex with specific partners) that identified respondents as inconsistent across rounds if they reported sexual experience in a measure and then indicated never having had sex in the same measure in the subsequent round.

^dAlmost all MSAS respondents (99.5%) selected Chichewa at baseline.

^eRespondents listened to the following script: “Now we are going to ask you some questions about your sexual activity. We know that some young people have sex and some have sex with more than one person, while others do not have sex at all... What we mean by sex is full penetration. We want to find out about everyone you have had sex with in your lifetime, even if it was a “hit and run,” and even if it involved someone like a teacher, employer, or stranger.” The script also probed by asking about forced sex.

^fRespondents who reported never having had sex in the age at first sex question listened to the following script before they were asked the questions about sex with specific people: “You have answered that you have never had sex. However, just to make sure we understand, and have this right, we are going to ask you some more questions about specific people with whom you might have had sex.” Respondents who did report an age at first sex listened to the following: “Now we would like to ask you some questions about specific people with whom you might have had sex.”

Predictors

The following predictors were included in the analysis: school status, schooling attainment, and literacy and numeracy skills. School status was based on whether a respondent was attending school at the time of the interview and, for respondents not attending school, the time since they had left school. We measured schooling attainment as the highest standard ever attended at the time of the survey, based in part on the premise that, controlling for age, adolescents who have attended higher standards are more likely to have been exposed to peers who are sexually experienced than adolescents who have only attended lower grades (25). Schooling attainment may also reflect non-cognitive skills that might be gained at school such as obedience, problem solving, and self-discipline. To measure respondents' academic skills we evaluated literacy and numeracy and created three categories: lacking basic skills (illiterate and innumerate), limited skills (literate but not numerate), and literate and numerate. Respondents were asked to read aloud two simple sentences in the national language, Chichewa; we considered respondents literate if they could read both sentences correctly. Respondents were also asked to complete a short mathematics assessment. In 2007, the evaluation consisted of 12 problems that involved ordering numbers, addition, subtraction, multiplication, division, and solving word problems drawn from the Malawi Institute of Education (MIE) achievement tests for standard 3. [§]We considered respondents numerate if they responded accurately to at least 11 of the 12 problems. We also controlled for other sociodemographic characteristics that might influence adolescent reports of sexual behavior, specifically age, ethnic group, nonresidence with either parent, parental educational attainment, and a count of household assets as a measure of household wealth.

We first estimated multinomial logistic regression models to simultaneously explore differences in the characteristics of respondents who consistently reported never having sex at baseline, or inconsistently reported having ever had sex, relative to respondents who consistently reported ever having sex at baseline. Then, we estimated logistic models of the likelihood of retracting reports of sexual initiation across consecutive rounds for each measure of sex, pooling the data for the two sets of consecutive rounds (rounds 1–2 and 2–3) into one model. This analysis was restricted to respondents who reported premarital sex in one round and were successfully re-interviewed in the subsequent round. We conduct all analyses separately for females and males, because adolescent females in Malawi drop out of school and transition into marriage at much higher rates than males.

Results

Reports of premarital sex at baseline

Table 1 shows the distribution of premarital sexual behavior reports at baseline. Males are more likely than females to report ever having had premarital sex overall, and for both measures of sex. Reports of age at first sex are slightly higher than reports of sex with partners for both females and males; nonetheless, substantial inconsistencies are observed in both directions. Of respondents who report ever having sex in response to either measure, females are more likely to be inconsistent reporters.

Table 2 presents means of selected education variables by responses to the sexual behavior questions at baseline. For both females and males, those who report consistently never having sex are more likely to attend school than those who report sex either consistently or inconsistently. Females and males who report sex inconsistently have, on average, lower

[§]The Malawi Institute of Education is a parastatal organization that is charged by the Ministry of Education with curriculum development, assessment, and teacher training programs.

schooling attainment, and are less likely to have combined academic skills than respondents who provide consistent reports.

Table 3 shows relative-risk ratios from unadjusted and adjusted multinomial logistic regression models predicting reports of premarital sex at baseline. The base category is consistent reports of having ever had sex. The upper panel presents results for consistent reports of having never had sex, and the lower panel for inconsistent reports of sex.

Results for females—School attendance and having left school two or more years ago are associated with an increased likelihood, relative to having left school within the past year, of consistently reporting never having sex and of inconsistently reporting sex over consistently reporting sex. In the unadjusted models, both higher schooling attainment and higher academic skills are associated with a reduced likelihood of reporting sex inconsistently over reporting sex consistently, but in the adjusted model schooling attainment is not significant.

Results for males—School attendance and having left school two or more years ago are associated with an increased likelihood of consistently reporting never having had sex over consistently reporting sex. In the unadjusted models, schooling attainment and stronger academic skills are associated with a reduced likelihood of reporting sex inconsistently as compared to reporting sex consistently; however, in the adjusted model these predictors do not achieve statistical significance.^h

Reports of premarital sex across rounds

Next we investigated consistency of reporting across rounds. Table 4 shows that roughly one-quarter to one-third of never-married respondents who reported premarital sex in one round reported differently in the subsequent round. Table 5 presents results from the logistic regression models. In these regressions, we differentiate individuals who were attending school at the later round of each pair of rounds, who left school between rounds, and who were out of school at both rounds.ⁱ Schooling attainment and academic skills are measured by the highest grade attended and literacy and math scores as of the later of the two subsequent interviews.

Results for females—For both measures, females who continue to attend school are significantly more likely to contradict their earlier report of premarital sex than those who left school across rounds. Schooling attainment is unrelated to the likelihood of “retracting” reports of sex in either measure. Females with the strongest academic skills appear to be more likely than those who lack basic skills to contradict prior reports of premarital sex, but the results are only marginally significant.

Results for males—Males who continue to attend school are also more likely to contradict reports of premarital sex, although the results are only statistically significant for the age-at-first-sex measure. Higher schooling attainment is negatively associated with the likelihood of “retracting” reports of premarital sex in both measures. Stronger academic skills, however, are positively associated with the likelihood of contradicting prior reports of sex with partners.

^hIt should be noted that correlations between schooling attendance, attainment, skills, and age are low to moderate for both males and females. Late school entry, grade repetition, and temporary withdrawal from school are common; therefore, there is large variability in the ages of students who attend the same grade ($R < 0.2$). The highest correlation ($R = 0.6$), was between schooling attainment and lacking basic skills.

ⁱFive females and 35 males who returned to school between rounds are included in the “attend school” category.

It should be noted that, for both measures, males and females who report sex inconsistently within an earlier round are significantly more likely to report that they never had sex in the subsequent round (results not shown), suggesting a group of respondents who may have mistakenly reported sex in the first round.

Discussion

The longitudinal data collected in the MSAS permit analysis of consistency in sexual behavior reporting over multiple rounds. In this paper we were interested in addressing two questions. The first was whether those attending school are more likely to misreport sexual behavior than their out-of-school peers. We found that reports of premarital sexual experience are strongly influenced by adolescents' schooling status, particularly in the case of females. As other studies have shown, school-going females are less likely to report ever having had sex. However, school-going females are also more likely to report inconsistently within a survey round and to "retract" reports of sex in later rounds than are females who have recently left school, casting doubt on the reliability of some schoolgirls' reported abstinence.

Our second question examined whether adolescents' schooling attainment and academic skills were associated with greater consistency in the reporting of sexual behavior within and across rounds. Although a previous study (2) found no association between having failed a grade and inconsistent reporting of sex, we find that respondents' literacy and numeracy skills are associated with the reporting of sexual behavior. Females who are literate and numerate are less likely to report inconsistently within a survey than those who cannot read and those who are not considered numerate. However, both females and males at higher skill levels are more likely to contradict previous reports of premarital sex across rounds. Even though respondents do not need to be literate to use ACASI, participants in a methodological study in Zimbabwe claimed increased comprehension when hearing questions while reading them (16). Among less literate populations, ACASI might work better if the questionnaire is short and the questions are simple. The level of inconsistency both within a survey round and across rounds reflects the difficulties in collecting reliable sexual behavior data from young people in settings such as rural Malawi, where education levels are low and sex among school-going females is not socially accepted. Inconsistent responses from students, especially those that contradict prior affirmations of sexual experience, may reflect the threat posed by sexual activity to their continued enrollment (21) as well as conformity to a schoolgirl identity that assumes abstinence (26,27). Individuals with stronger academic skills may have greater aspirations for continued school enrollment (regardless of current enrollment status), leading to a higher rate of socially acceptable reversals. Further, being a consistent respondent does not imply being a truthful respondent. Of never-married respondents who consistently reported never having sex at baseline, 3.5% of females reported having ever been pregnant and 2.1% of males reported having ever made a girl pregnant. Researchers should continue to search for improved methods to collect adolescent sexual behavior data, and be aware of biases caused by systematic misreporting in self-reported data.

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Implications and Contribution summary statement

Adolescents' schooling status and academic skills were found to be associated with self-reporting of sexual behavior and with inconsistency of responses collected using ACASI. Researchers should continue to search for improved methods to collect adolescent sexual behavior data, and be aware of biases caused by systematic misreporting in self-reported data.

Table 1

Premarital sexual behavior reports at baseline, never married 14–17 year old respondents

	Females	Males	<i>b</i>
Percentage who reported an age at first sex	27.8 (1081)	47.5 (1239)	***
% of whom reported no sex partners	40.5 (301)	27.2 (588)	***
Percentage who reported sex with a partner	25.6 (1081)	45.6 (1239)	***
% of whom reported no age at first sex	35.4 (277)	24.2 (565)	***
Percentage who reported having sex in response to either age-at-first-sex or sex-with-partners question	36.9 (1081)	58.5 (1239)	***
% of whom reported inconsistently ^a	55.1 (399)	41.0 (725)	***

Note: Denominators for all percentages are in parentheses.

^a Reports of sex are considered inconsistent if a respondent reported an age at first sex but did not identify any sexual partners, or if a respondent reported any sexual partners but did not provide an age at first sex.

^b Two-sided p-values from tests of proportions between females and males.

p<.001;

**
p<.01;

*
p<.05;

[†]
p<.1

Table 2

Means of education variables for never-married MSAS respondents at baseline, by gender and reports of premarital sex within baseline

Characteristics	Females			Males		
	Consistent		Inconsistent ^a Reported sex (N=220)	Consistent		Inconsistent ^a Reported sex (N=297)
	Reported <i>never</i> had sex (N=682)	Reported <i>ever</i> had sex (N=179)		Reported <i>never</i> had sex (N=514)	Reported <i>ever</i> had sex (N=428)	
School status						
% Attend school	80.6	62.6	67.3	72.8	67.1	63.0
% Left current or past school year	10.4	30.2	19.5	15.0	21.5	19.9
% Left two or more school years ago	8.9	7.3	13.2	12.3	11.4	17.2
Schooling attainment						
Mean highest standard attended	6.2	6.4	5.9	5.7	5.9	5.4
Literacy and numeracy skills ^b						
% Lacking basic skills	13.8	11.2	22.7	20.2	18.7	27.9
% Limited skills	50.9	50.8	52.3	47.3	50.0	45.8
% Combined skills	35.3	38.0	25.0	32.5	31.3	26.3

^a Reports of sex are considered inconsistent if a respondent reported an age at first sex but did not identify any sexual partners, or if a respondent reported any sexual partners but did not provide an age at first sex.

^b Lacking basic skills=illiterate and innumerate; limited skills=illiterate but innumerate; combined skills=literate and numerate. Respondents were considered to be literate if they could read aloud two simple sentences in Chichewa and numerate if they solved at least 11 of 12 basic math problems. Three females and 13 males who were coded as illiterate but were able to solve the math test are included in the combined skills category.

Table 3

Relative-risk ratios (RR) and robust 95% confidence intervals (95% CI) from multinomial logistic regression models predicting premarital sexual behavior reports at baseline of never-married MSAS respondents

Predictors	Females			Males		
	RR	Unadjusted ^a (95% CI)	Adjusted ^b (95% CI)	Unadjusted ^a (95% CI)	Adjusted ^b (95% CI)	RR (95% CI)
Consistently reported never had sex						
School status						
Attend school	3.7***	(2.5–5.6)	4.1*** (2.6–6.5)	1.6* (1.1–2.2)	1.7* (1.1–2.4)	
Left current or past year (ref)	1.0		1.0	1.0	1.0	
Left two or more years ago	3.6***	(1.8–7.2)	2.7*** (1.3–5.8)	1.5† (0.9–2.5)	1.6† (0.9–2.6)	
Schooling attainment						
Highest standard attended	0.9	(0.8–1.0)	1.0 (0.9–1.1)	0.9 (0.9–1.0)	0.9 (0.8–1.0)	
Literacy and numeracy skills ^c						
Lacking basic skills (ref)	1.0		1.0	1.0		
Limited skills	0.8	(0.5–1.4)	0.6 (0.3–1.2)	0.9 (0.6–1.2)	1.0 (0.6–1.5)	
Combined skills	0.8	(0.4–1.3)	0.6 (0.2–1.3)	1.0 (0.7–1.4)	1.1 (0.6–1.8)	
Inconsistently reported sex						
School status						
Attend school	1.7*	(1.0–2.7)	2.5*** (1.5–4.2)	1.0 (0.7–1.5)	1.2 (0.8–1.9)	
Left current or past year (ref)	1.0		1.0	1.0	1.0	
Left two or more years ago	2.8**	(1.3–6.0)	2.1† (0.9–4.8)	1.6† (1.0–2.7)	1.4 (0.8–2.5)	
Schooling attainment						
Highest standard attended	0.9**	(0.8–1.0)	1.0 (0.9–1.2)	0.9** (0.8–0.9)	0.9 (0.8–1.0)	
Literacy and numeracy skills ^c						
Lacking basic skills (ref)	1.0		1.0	1.0		
Limited skills	0.5*	(0.3–0.9)	0.4* (0.2–0.8)	0.6* (0.4–0.9)	0.8 (0.5–1.2)	
Combined skills	0.3***	(0.2–0.6)	0.2** (0.1–0.6)	0.6** (0.4–0.8)	0.8 (0.4–1.3)	

The base category is “Consistently reported having ever had sex.” Females: N=1081; Males: N=1239.

^a A multinomial logistic regression was estimated separately for each of the key predictors: school status, schooling attainment, and literacy and numeracy skills.

^b All predictors were included in one multinomial logistic regression. The adjusted models also control for respondent's age and ethnic group, nonresidence with either parent, mother's and father's educational attainment, and a count of household assets.

^c Lacking basic skills=illiterate and innumerate; Limited skills=literate but innumerate; Combined skills=literate and numerate. Respondents are considered to be literate if they could read aloud two simple sentences in Chichewa and numerate if they solved at least 11 of 12 basic math problems. Three females and 13 males who were coded as illiterate but were able to solve the math test are included in the combined skills category.

*** p<.001;
 ** p<.01;
 * p<.05;
 † p<.1

Table 4

Changes in sexual initiation reports: respondents who had never married and reported premarital sex in an earlier round, whose responses in the subsequent round contradict their earlier report

	<u>Response to age-at-first-sex question</u>		<u>Response to sex-with-specific-partners questions</u>	
	Females	Males ^a	Females	Males ^a
Report premarital sex in round 1 and are re-interviewed in round 2 (N)	278	522	258	495
% in round 2 who contradict their round 1 response	36.7	30.7 [‡]	36.8	32.7
Report premarital sex in round 2 and are re-interviewed in round 3 (N)	245	480	218	453
% in round 3 who contradict their round 2 response	22.4	23.1	27.5	25.2

^aTwo-sided p-values from tests of proportions between females and males.

p<.001;

**
p<.01;

*
p<.05;

[‡]
p<.1

Table 5

Odds ratios (OR) and robust 95% confidence intervals (95% CI) for clusters at respondent level from logistic regression models predicting contradiction of previous report of premarital sex by never-married respondents

Predictors	Females				Males			
	OR	Unadjusted ^a (95% CI)	Adjusted ^b (95% CI)	OR	Unadjusted ^a (95% CI)	Adjusted ^b (95% CI)	OR	Adjusted ^b (95% CI)
Contradiction of earlier affirmative response: Age-at-first-sex								
School status								
Attend school	3.1 ***	(1.8–5.3)	3.2 ***	(1.5–6.6)	2.1 **	(1.2–3.6)	1.8 *	(1.0–3.2)
Drop out between rounds (ref)	1.0		1.0		1.0		1.0	
Out of school both rounds	1.1	(0.6–2.1)	1.0	(0.5–2.0)	2.1 *	(1.2–3.7)	1.6	(0.9–3.0)
Schooling attainment								
Highest standard attended	1.0	(0.9–1.1)	0.9	(0.8–1.1)	0.9 *	(0.9–1.0)	0.9 †	(0.8–1.0)
Literacy and numeracy skills ^c								
Lacking basic skills (ref)	1.0		1.0		1.0		1.0	
Limited skills	0.7	(0.4–1.3)	0.7	(0.3–1.6)	0.6 *	(0.4–0.9)	0.8	(0.5–1.4)
Combined skills	1.1	(0.6–2.1)	1.2	(0.5–3.0)	0.8	(0.5–1.3)	1.3	(0.7–2.3)
Contradiction of earlier affirmative response: Sex-with-specific-partners								
School status								
Attend school	2.0 **	(1.2–3.4)	2.0 *	(1.1–3.8)	1.4	(0.9–2.3)	1.4	(0.8–2.3)
Drop out between rounds (ref)	1.0		1.0		1.0		1.0	
Out of school both rounds	0.8	(0.5–1.5)	0.9	(0.5–1.7)	1.0	(0.6–1.7)	0.7	(0.4–1.2)
Schooling attainment								
Highest standard attended	1.0	(0.9–1.1)	0.9	(0.8–1.1)	0.9 †	(0.9–1.0)	0.8 **	(0.7–0.9)
Literacy and numeracy skills ^c								
Lacking basic skills (ref)	1.0		1.0		1.0		1.0	
Limited skills	1.0	(0.6–1.7)	1.3	(0.6–2.6)	1.0	(0.7–1.5)	1.7 *	(1.0–2.8)
Combined skills	1.5	(0.8–2.8)	2.0 †	(0.9–4.5)	1.4	(0.9–2.2)	2.9 **	(1.6–5.2)

Females: N=522 for contradiction of age-at-first-sex response, and N=475 for contradiction of sex-with-partner response.

Males: N=1002 for contradiction of age-at-first-sex response, and N=947 for contradiction of sex-with-partner response.

^a A logistic regression was estimated separately for each of the key predictors: school status, schooling attainment, and literacy and numeracy skills.

^b All predictors were included in one logistic regression. The adjusted models also control for respondent's age and ethnic group, nonresidence with either parent, mother's and father's educational attainment, and a count of household assets. Ethnic group and parents' education were measured at baseline. All other covariates are time-varying and are measured at the later round of each pair of rounds. The models also control for whether the respondent married between rounds, whether the respondent had reported sex inconsistently in the earlier round, and whether the observation is for reports across rounds 2–3 versus rounds 1–2.

^c Lacking basic skills=illiterate and innumerate; limited skills=literate but innumerate; combined skills=literate and numerate. Respondents were considered to be literate if they could read aloud two simple sentences in Chichewa and numerate if they solved at least 11 of 12 basic math problems. Four females and five males who were coded as illiterate but were able to solve the math test are included in the combined skills category.

*** p<.001;

** p<.01;

* p<.05;

† p<.1