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Let's Talk about Sex, Maybe: Interviewers, Respondents, and Sexual Behavior Reporting in Rural South Africa

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Abstract

Researchers are often skeptical of sexual behavior surveys: Respondents may lie or forget details of their intimate lives, and interviewers may exercise authority in how they capture responses. We use data from a

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2010–2011 cross-sectional sexual behavior survey in rural South Africa to explore *who says what to whom* about their sexual lives. Results show an effect of fieldworker age across outcomes: Respondents report "safer," more "responsible" sexual behavior to older fieldworkers, and an effect of fieldworker sex; men report more sexual partners to female fieldworkers. Understanding fieldworker effects on the production of sexual behavior survey data serves methodological and analytical goals.

Keywords
interviewer effects, sexual behavior, social desirability, surveys, Africa

Introduction

Researchers are often skeptical of sexual behavior surveys: Respondents may lie (see Gribble et al. [1999] on reporting bias) or forget details of their intimate lives (see Graham et al. [2003] on recall bias), and interviewers may exercise authority in how they capture responses (see Randall et al. [2013] on interviewer power). Respondents might manage their "presentation of self" (Goffman 1959) during surveys by minimizing the gap between their own behavior and the perceived social values of the interviewer (Hewett et al. 2004). Concerns about reporting bias extend to myriad topics, such as political knowledge (D. W. Davis and Silver 2003) and economic attitudes (Groves and Fultz 1985). Given social expectations of what is considered "right," sexual behavior reporting is likely subject to bias (Wellings et al. 2006).

Methodologists have examined influences on sexual behavior reporting, including interviewer characteristics such as sex (e.g., McCombie and Anarfi 2002), age (e.g., Ford and Norris 1997), and ethnicity (e.g., Becker et al. 1995) as well as familiarity of the interviewer to the respondent (Weinreb 2006). Some studies used data collection techniques that obviate concerns about reporting sensitive topics to a live interviewer, including audio-assisted computer self-interviewing (ACASI, e.g., Oloo et al. 2012), although this may be less effective with older and less-educated participants (Reichmann et al. 2010). Methodological inquiries on collecting sensitive data are important in a setting like South Africa, where understanding risky sexual behaviors is critical for addressing high HIV prevalence (see Gómez-Olivé et al. 2013) and where our understanding of fieldworker influences on survey data is scant (for exceptions, see Bignami-Van Assche et al. 2003).

We use data from a 2010–2011 cross-sectional study on sexual behavior conducted in rural South Africa by 10 local fieldworkers (or interviewers). We test assumptions about social desirability bias to explore *who says what to whom* about their sexual lives. Based on our knowledge of the setting and relevant literature, we hypothesize that interviewer sex and age will impact reporting, showing that (1) men and women will report more sexual partners to same-sex rather than opposite-sex interviewers and (2) respondents will not reveal more sexual partners to older interviewers. With high HIV prevalence and wide-scale social marketing efforts promoting HIV prevention, we assume it is socially desirable to report fewer sexual partners and sexual behaviors that demonstrate ''safe'' or ''responsible'' sexual decision making.

Setting

The Agincourt Health and Socio-Demographic Surveillance System (AHDSS) is a former apartheid homeland area in the Bushbuckridge subdistrict of Mpumalanga Province in the northeast of South Africa. The AHDSS has been monitoring vital events annually since 1992 (Kahn et al. 2012). The 2011 population was around 90,000 people in 28 villages (420 km^2 area). All villages in Agincourt have water provided through neighborhood taps, at least one primary school, and most have electricity and a secondary school (Kahn et al. 2012). Median years of education range from six to 11, and the most common jobs include construction for men and retail and domestic work for women (Blalock 2014). Labor migration is high, especially among men aged 35–50, of whom 60% live outside the study area for six plus months per year (Kahn et al. 2012). The main ethnic group is ama-Shangaan, and Christianity is the most prominent religion.

Ha Nakekela Study

In 2010–2011, we collected data on sexual behavior in the *Ha Nakekela* study (''We Care'' in XiShangaan). The sample included 7,662 individuals permanently residing in the site, selected by sex and age (15+) stratified random sampling from the 2009 Census data.

All sampled participants were visited in their homes by a fieldworker and invited to participate in the study. There were five male and five female fieldworkers (aged 28–44; mid-study, one male fieldworker left and was replaced by a female of a different age-group). Fieldworkers were assigned to villages and households randomly by the field supervisor and met the

respondent privately. If the interviewer knew the respondent, the interview was assigned to another fieldworker. The home visit lasted approximately 45 minutes and included written consent to participate (assent for minors), two risk behavior surveys (for chronic diseases and sexual behavior), and collection of biomarkers for HIV and cardiometabolic risk. The study received ethical approvals from University of the Witwatersrand Human Research Ethics Committee and the Mpumalanga Provincial Research and Ethics Committee.

Data and Methods

We use data from the sexual behavior survey that yielded 4,684 responses from the 7,662 individuals in the sample. The remaining respondents were ineligible (469), not located (2,156), or refused to participate (353). The survey included respondents' sexual practices over the past two years. For each sexual partner reported, interviewers asked about the nature of the relationship (e.g., casual partner, spouse), duration, and details about behavioral sexual risk (e.g., knowledge of partner's HIV status, condom use, drug/alcohol use). Additional survey questions included lifetime number of sexual partners, HIV testing history, previous diagnosis for sexually transmitted infections (STIs), and the like.

We modeled four outcomes to explore the effects of fieldworker and respondent characteristics on sexual behavior reporting. The subject of these measures is widely invoked in social marketing efforts to curb HIV transmission, and we believe highly sensitive and prone to social desirability bias (Edwards et al. 2005).

1. Lifetime sexual partners: What is the total number of sexual partners you have had in your life?
2. Condom use: Did you use a condom the last time you had sex with this partner?
3. Discussing HIV: At the time you first had sex with this partner, had you ever discussed HIV with him/her?
4. HIV testing: Have you ever been tested for HIV?

We modeled lifetime sexual partners using negative binomial regression and condom use, discussing HIV, and HIV testing using logistic regression (with correlation among partners of the same respondent, when applicable). Our approach was to first model the outcome using respondent covariates we expected would influence the outcome but were not the focus of our research question about fieldworker effects. We next

included fieldworker characteristics to assess their impact on sexual behavior reporting. Finally, we tested interactions between respondent and fieldworker characteristics.

For each outcome, we first fit a base model with no fieldworker effects, including covariates of respondent's age (mean centered; see Aiken and West 1991), sex (male or not), village (indicators for each village excluding the referent), migration history (having resided outside study area for six plus months in previous census year), and quintiles of the respondent's 2009 household socioeconomic status. For partner data, we also included the partner's age (mean centered) and type of partner (girlfriend/boyfriend, casual, or anonymous; referent living together).

We then included fieldworker effects for age (dichotomized as <35 and 35+ years old) and sex (male or not). Next, we tested interactions between respondent and fieldworker characteristics by first interacting respondent and fieldworker sex; then respondent and fieldworker age; and finally fieldworker age and respondent sex, and respondent age and fieldworker sex. Interactions that improved overall model fit (using likelihood ratio tests of the nested models) were included in the final models. There was little variation on other fieldworker characteristics: All had completed secondary school, were Xishangaan-speakers from the study site (per AHDSS job requirements), and, to the best of our knowledge, predominately Christian. We believe this to be a study strength: Since the fieldworkers were similar on other characteristics, we are likely testing actual fieldworker (age and gender) effects. We can only assume, however, about reporting based on our results. Causal inference would require methodological strategies such as randomization or experimental designs.

We assessed model sensitivity to the fieldworker age cut-off by testing ± 1 year differences. The results were not substantively different. R. E. Davis and colleagues (2010) note that one problem with studying interviewer age effects is that studies often dichotomize age in ways that obscure important generational differences. Our fieldworker age range (28–44) gives us variation for comparison, but does not categorize fieldworkers unrealistically. Our "older fieldworker" age category starts at age 35, which may seem young in some parts of the world. In Agincourt, however, life expectancy is 55 years for males, 62 years for females, and more than 50% of first births occur before age 20 (Kahn et al. 2012; Williams et al. 2013). We also assessed sensitivity to individual fieldworkers by testing all models with an indicator for each fieldworker, allowing us to detect if an outlying fieldworker(s) was influencing results. All models incorporated sampling (inverse probability) weights.

Results

Respondent and fieldworker sample descriptives are presented in Table 1. The sample was balanced by sex, with a mean age of 41 years. Almost 60% of the sample had a previous migration history. Additional information presents average responses to sexual behavior survey questions. For fieldworkers, 45.5% were male and ages ranged from 28 to 44, with an average among those under 35 of 29.6 years and 39.2 years among those 35+.

Lifetime Sexual Partners

Table 2, column (a) shows the results of the base negative binomial regression for number of lifetime sexual partners, without fieldworker effects. Including age^2 ($p < .001$) and age^3 ($p < .001$), interacted with sex ($p < .001$), significantly improved model fit.

Figure 1 shows the predicted number of lifetime sexual partners by sex and age, averaging across the other covariates. There is a general age effect—one accumulates more sexual partners throughout the life course. It starts to decline past the mid-40s, indicating either recall bias (older respondents may not accurately remember their total number of lifetime sexual partners) or a cohort effect (older people have had less sexual partners than the generations that proceed them). Across all ages, males report a higher number of lifetime sexual partners.

Table 2, column (b) shows the results of the negative binomial regression, including the fieldworker's sex and age. Interacting respondent and fieldworker's sex significantly improved model fit ($p < .001$); further interacting respondent and fieldworker's age significantly improved model fit ($p < .001$); finally, interacting respondent's sex and fieldworker's age, as well as fieldworker's sex and respondent's age, significantly improved model fit ($p = .001$) and constituted the final model.

Figure 1 shows the predicted number of lifetime sexual partners by respondent and fieldworker's sex and age. For all respondents, having an older fieldworker reduced the number of reported lifetime sexual partners, although the effect is stronger for male respondents than for females. Moreover, for male respondents, having a male fieldworker decreased the number of reported lifetime sexual partners ($\beta = -0.296$). Altogether, male respondents report more sexual partners to female fieldworkers than male fieldworkers but report fewer sexual partners to older fieldworkers than younger ones.

Table 1. Respondent and Fieldworker Sample Characteristics, by Respondent Sex, Agincourt, South Africa, 2010–2011.

	Proportion (Mean/SD)		
Respondent Characteristics	All	Male	Female
Male	49.2	100.0	0.0
Age, years	40.9/18.1	40.4/17.8	41.4/18.4
Quintiles 2009 SES			
First (lowest)	12.9	15.6	15.6
Second	17.9	18.2	19.3
Third	21.6	19.9	21.1
Fourth	21.8	20.6	20.3
Fifth (highest)	25.8	25.6	23.7
Previous migration history	59.5	54.6	64.2
Number of lifetime sexual partners	4.7/8.2	8.5/12.2	2.3/1.6
Number of sexual partners in last 24 months	1.5/0.9	1.8/1.0	1.3/0.6
Condom use at last sexual intercourse among all partners	26.8/40.9	27.7/39.8	26.0/41.9
Discuss HIV among all partners	20.6/37.1	17.4/32.8	23.7/40.6
Fieldworker characteristics			
Male	45.5	100.0	0.0
Age			
Under 35	63.6	80.0	50.0
35 and over	36.4	20.0	50.0

Note: SD = standard deviation; SES = socioeconomic status.
[a]Percentages may not sum to 100% due to rounding error.

Condom Use

Table 3, column (a) shows the results of the base logistic regression on the probability of condom use at last sexual intercourse, without fieldworker effects. Including age^2 significantly improved model fit ($p < .001$).

Figure 2 shows the predicted probability of using a condom at last sexual intercourse by sex and age, averaging across the other covariates. Reported condom use declined with age. Lower reported condom use for females may reflect childbearing intentions; higher reported condom use for males may reflect condom use with additional sexual partners, though these sex differences are not significant (95% CI: 0.82, 1.26).

Table 3, column (b) shows the results of the logistic regression, including the fieldworker's sex and age. Interacting respondent and fieldworker's age significantly improved model fit ($p = .011$).

Table 2. Negative Binomial Regression of Number of Lifetime Sexual Partners: (a) Base Model (Sociodemographic Characteristics and Village) and (b) Added Fieldworker Effects, Agincourt, South Africa, 2010–2011.

	(a) Base ($N = 4,467$)		(b) With Fieldworker Effects ($N = 4,467$)	
	β	95% CI	β	95% CI
Respondent age and sex				
Male	1.418***	[1.323, 1.513]	1.609***	[1.476, 1.742]
Age	−0.013***	[−0.015, −0.010]	−0.010***	[−0.014, −0.006]
Age^2	−0.001***	[−0.001, −0.000]	−0.001***	[−0.001, −0.001]
Age^3	<0.000***	[0.000, 0.000]	< 0.000***	[0.000, 0.000]
Male × Age	0.024***	[0.020, 0.028]	0.023***	[0.019, 0.027]
Controls: village, SES, migration history				
Village				
1	—	—	—	—
2	0.127	[−0.070, 0.324]	0.13	[−0.063, 0.322]
3	−0.324***	[−0.509, −0.139]	−0.329***	[−0.519, −0.138]
4	−0.103	[−0.280, 0.074]	−0.093	[−0.274, 0.088]
5	0.024	[−0.153, 0.200]	0.011	[−0.166, 0.187]
6	−0.168	[−0.411, 0.074]	−0.155	[−0.392, 0.081]
7	−0.103	[−0.274, 0.068]	−0.083	[−0.257, 0.091]
8	−0.005	[−0.156, 0.147]	−0.011	[−0.165, 0.143]
9	−0.08	[−0.259, 0.099]	−0.076	[−0.260, 0.107]
10	−0.062	[−0.429, 0.305]	−0.055	[−0.437, 0.326]
11	−0.151	[−0.335, 0.032]	−0.165	[−0.348, 0.018]
12	0.111	[−0.057, 0.280]	0.103	[−0.067, 0.274]
13	0.181	[−0.071, 0.433]	0.174	[−0.065, 0.412]
14	0.041	[−0.193, 0.275]	0.033	[−0.191, 0.257]
15	0.19	[−0.036, 0.416]	0.191	[−0.037, 0.419]
16	−0.197	[−0.438, 0.044]	−0.185	[−0.427, 0.056]
17	−0.027	[−0.211, 0.156]	−0.026	[−0.214, 0.161]
18	0.108	[−0.248, 0.465]	0.095	[−0.242, 0.431]
19	−0.072	[−0.224, 0.081]	−0.069	[−0.226, 0.087]
20	−0.057	[−0.232, 0.118]	−0.062	[−0.243, 0.120]
21	−0.02	[−0.186, 0.146]	−0.02	[−0.189, 0.150]
2009 SES Quintiles				
First (lowest)	—	—	—	—
Second	−0.131*	[−0.235, −0.028]	−0.134**	[−0.234, −0.034]
Third	−0.141**	[−0.245, −0.037]	−0.146**	[−0.247, −0.045]
Fourth	−0.077	[−0.185, 0.030]	−0.075	[−0.179, 0.029]

(continued)

Table 2. (continued)

	(a) Base ($N = 4,467$)		(b) With Fieldworker Effects ($N = 4,467$)	
	β	95% CI	β	95% CI
Fifth (highest)	−0.119*	[−0.227, −0.010]	−0.109*	[−0.214, −0.004]
Past history of migration	0.025	[−0.040, 0.090]	0.025	[−0.038, 0.089]
Fieldworker × respondent effects				
Male fieldworker			0.039	[−0.019, 0.098]
Male fieldworker × respondent male			−0.296***	[−0.432, −0.160]
Aged 35+ fieldworker			−0.08	[−0.169, 0.009]
Aged 35+ fieldworker × respondent age			0	[−0.005, 0.005]
Aged 35+ fieldworker × respondent age^2			0.001***	[0.000, 0.001]
Aged 35+ fieldworker × respondent age^3			−0.000**	[−0.000, −0.000]
Aged 35+ fieldworker × respondent male			−0.203**	[−0.341, −0.065]
Male fieldworker × respondent age			−0.006***	[−0.010, −0.003]
Constant	1.039***	[0.875, 1.202]	1.048***	[0.881, 1.214]

Note: CI = confidence interval; SES = socioeconomic status.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed tests).

Figure 2 shows the predicted probability of condom use at last sexual intercourse by respondent and fieldworker's age. For all respondents, and across the life course, having an older fieldworker increased the odds of reported condom use at last sexual intercourse (odds ratio [OR] = 1.4). This effect is strongest for older respondents: As respondents become older, they are more likely to report condom use to older fieldworkers (OR = 1.028).

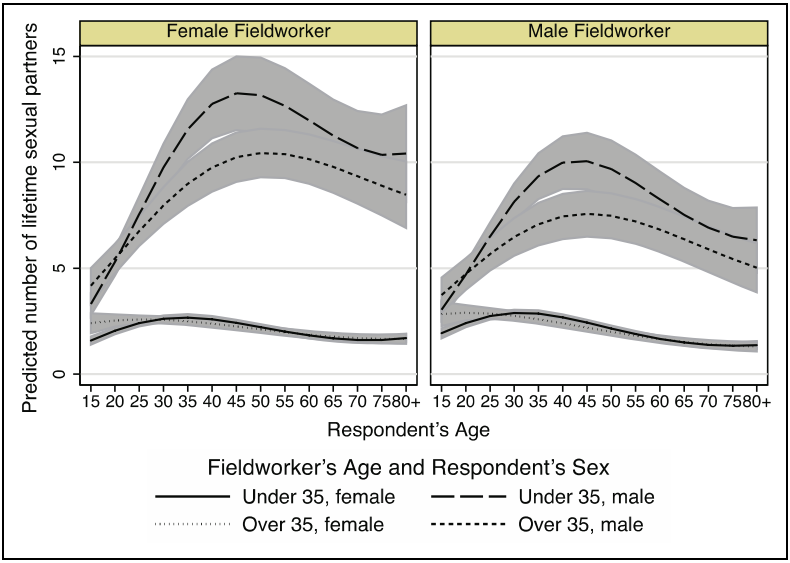

Figure 1. Predicted number of lifetime sexual partners using average marginal effects, Table 2, column (b), by respondent's and fieldworker's age and sex, Agincourt, South Africa, 2010–2011.

Discussing HIV

Table 4, column (a) shows the results of the base logistic regression on the probability of discussing HIV with a partner, without fieldworker effects. Figure 3 shows the predicted probability of discussing HIV with a partner by sex and age, averaging across the other covariates. Reported discussing HIV with a partner declined with age.

Table 4, column (b) shows the results of the logistic regression including the fieldworker's age. Interacting respondent and fieldworker's age significantly improved model fit ($p < .001$). Sensitivity tests of outlier fieldworkers suggested one with significantly different results compared to the others, who we thus omitted from the final model.

Figure 3 shows the predicted probability of discussing HIV with a partner by respondent and fieldworker's age. Having an older fieldworker and a male fieldworker increased the probability of reporting having discussed HIV with a partner (OR = 1.649; OR = 1.427, respectively).

Table 3. Logistic Regression of Condom Use at Last Sexual Intercourse: (a) Base Model (Sociodemographic Characteristics, Village, Partner Characteristics) and (b) Added Fieldworker Effects, Agincourt, South Africa, 2010–2011.

	(a) Base ($N = 4{,}406$)		(b) With Fieldworker Effects ($N = 4{,}406$)	
	OR	95% CI	OR	95% CI
Respondent age and sex				
Male	1.014	[0.815, 1.261]	1.013	[0.813, 1.263]
Age	0.957***	[0.948, 0.966]	0.944***	[0.930, 0.958]
Age^2	0.999***	[0.998, 0.999]	0.999**	[0.998, 0.999]
Controls: Village, SES, migration history				
Village				
1	—	—	—	—
2	0.633	[0.350, 1.145]	0.635	[0.352, 1.148]
3	0.584	[0.310, 1.100]	0.583	[0.308, 1.101]
4	0.547	[0.285, 1.051]	0.547	[0.284, 1.054]
5	0.698	[0.380, 1.281]	0.697	[0.378, 1.284]
6	0.174***	[0.064, 0.471]	0.173***	[0.064, 0.466]
7	0.593	[0.311, 1.130]	0.587	[0.307, 1.122]
8	0.848	[0.498, 1.443]	0.856	[0.502, 1.459]
9	0.741	[0.380, 1.444]	0.746	[0.382, 1.455]
10	0.403	[0.143, 1.131]	0.399	[0.142, 1.119]
11	0.259***	[0.117, 0.571]	0.258***	[0.117, 0.569]
12	1.06	[0.598, 1.876]	1.047	[0.591, 1.855]
13	0.965	[0.455, 2.045]	0.988	[0.464, 2.100]
14	0.723	[0.367, 1.425]	0.723	[0.370, 1.415]
15	0.56	[0.242, 1.297]	0.57	[0.247, 1.315]
16	0.498	[0.245, 1.011]	0.493	[0.242, 1.004]
17	0.546*	[0.300, 0.995]	0.547*	[0.299, 1.000]
18	0.399	[0.143, 1.113]	0.402	[0.144, 1.126]
19	0.642	[0.377, 1.092]	0.641	[0.376, 1.094]
20	0.507*	[0.281, 0.917]	0.519*	[0.285, 0.943]
21	0.464**	[0.268, 0.805]	0.464**	[0.267, 0.807]
2009 SES Quintiles				
First (lowest)	—	—	—	—
Second	0.993	[0.709, 1.390]	0.993	[0.709, 1.391]
Third	1.274	[0.915, 1.774]	1.281	[0.921, 1.783]
Fourth	1.464*	[1.057, 2.026]	1.469*	[1.060, 2.034]
Fifth (highest)	1.478*	[1.057, 2.066]	1.465*	[1.048, 2.047]
Past history of migration	1.047	[0.837, 1.309]	1.049	[0.838, 1.313]

(continued)

Table 3. (continued)

	(a) Base ($N = 4,406$)		(b) With Fieldworker Effects ($N = 4,406$)	
	OR	95% CI	OR	95% CI
Controls: Partner age and type				
Partner's age	1.001	[0.994, 1.009]	1.001	[0.993, 1.008]
Partner type				
Living together	—	—	—	—
Girlfriend/boyfriend	3.659***	[2.899, 4.618]	3.654***	[2.893, 4.616]
Casual	3.339***	[2.530, 4.408]	3.286***	[2.490, 4.336]
Anonymous	3.434**	[1.426, 8.271]	3.343**	[1.398, 7.997]
Fieldworker × respondent effects				
Male fieldworker			1.107	[0.896, 1.367]
Aged 35+ fieldworker			1.402*	[1.049, 1.874]
Aged 35+ fieldworker × respondent age			1.028**	[1.011, 1.046]
Aged 35+ fieldworker × respondent age^2			1	[0.999, 1.002]

Note: CI = confidence interval; OR = odds ratio; SES = socioeconomic status.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed tests).

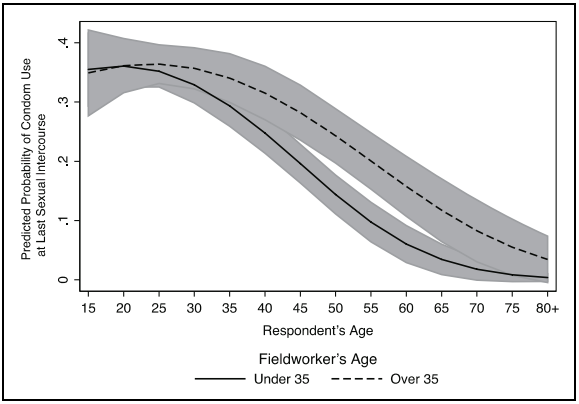

Figure 2. Predicted probability of condom use at last sexual intercourse using average marginal effects, Table 3, column (b), by respondent's and fieldworker's age, Agincourt, South Africa, 2010–2011.

Table 4. Logistic Regression of Discussing HIV with a Partner: (a) Base Model (Sociodemographic Characteristics, Village, Partner Characteristics) and (b) Added Fieldworker Effects, Agincourt, South Africa, 2010–2011.

	(a) Base ($N = 4{,}406$)		(b) With Fieldworker Effects ($N = 3{,}851$)	
	OR	95% CI	OR	95% CI
Respondent age and sex				
Male	0.964	[0.771, 1.204]	0.674**	[0.521, 0.872]
Age	0.974***	[0.966, 0.983]	0.957***	[0.945, 0.970]
Controls: village, SES, migration history				
Village				
1				
2	—	—	—	—
3	0.917	[0.526, 1.597]	1.081	[0.565, 2.070]
4	0.941	[0.476, 1.861]	1.349	[0.651, 2.793]
5	1.044	[0.549, 1.986]	1.378	[0.652, 2.916]
6	1.182	[0.643, 2.173]	1.105	[0.556, 2.196]
7	0.48	[0.188, 1.227]	0.372	[0.136, 1.016]
8	0.986	[0.526, 1.847]	0.97	[0.461, 2.042]
9	1.601	[0.920, 2.788]	1.565	[0.845, 2.898]
10	0.824	[0.432, 1.575]	0.945	[0.438, 2.037]
11	1.113	[0.491, 2.522]	1.022	[0.325, 3.209]
12	0.57	[0.276, 1.178]	0.578	[0.240, 1.393]
13	0.953	[0.518, 1.752]	1.265	[0.632, 2.533]
14	0.842	[0.432, 1.641]	0.938	[0.431, 2.042]
15	0.458	[0.198, 1.061]	0.576	[0.216, 1.533]
16	0.994	[0.470, 2.106]	1.527	[0.644, 3.622]
17	0.821	[0.380, 1.772]	0.913	[0.383, 2.179]
18	0.653	[0.342, 1.248]	0.718	[0.332, 1.554]
19	0.316*	[0.100, 0.995]	0.457	[0.130, 1.608]
20	1.2	[0.702, 2.051]	1.523	[0.821, 2.823]
21	0.756	[0.403, 1.417]	0.763	[0.374, 1.556]
2009 SES quintiles	0.7	[0.392, 1.252]	0.679	[0.342, 1.351]
First (lowest)				
Second	—	—	—	—
Third	0.977	[0.700, 1.364]	1.122	[0.763, 1.649]
Fourth	1.132	[0.808, 1.586]	1.087	[0.733, 1.611]
Fifth (highest)	1.174	[0.839, 1.642]	1.208	[0.822, 1.775]
Past history of migration	1.158	[0.930, 1.441]	1.231	[0.952, 1.592]

(continued)

Table 4. (continued)

	(a) Base ($N = 4{,}406$)		(b) With Fieldworker Effects ($N = 3{,}851$)	
	OR	95% CI	OR	95% CI
Controls: partner age and type				
Partner's age	1.014***	[1.008, 1.021]	0.999	[0.991, 1.007]
Partner type				
Living together	—	—	—	—
Girlfriend/boyfriend	1.751***	[1.391, 2.204]	1.678***	[1.241, 2.269]
Casual	1.161	[0.863, 1.564]	1.723**	[1.221, 2.432]
Anonymous	1.028	[0.370, 2.857]	0.825	[0.307, 2.215]
Fieldworker × respondent effects				
Male fieldworker			1.427**	[1.126, 1.808]
Aged 35+ fieldworker			1.649***	[1.299, 2.095]
Aged 35+ fieldworker × respondent age			1.038***	[1.022, 1.054]

Note: CI = confidence interval; OR = odds ratio; SES = socioeconomic status.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed tests).

HIV Testing

Table 5, column (a) shows the results of the base logistic regression on the probability of reporting ever taking an HIV test, without fieldworker effects. Including age^2 and age^3 significantly improved model fit ($p < .001$). Further interacting respondent's sex and age ($p < .001$) and age^2 ($p = .001$) significantly improved model fit and constituted the final model.

Figure 4 shows the predicted probability of ever taking an HIV test by sex and age, averaging across the other covariates. Women report a higher probability of ever taking an HIV test than men (likely because of antenatal testing) until after ages 50+. For men, the probability of ever taking an HIV test increases with age until age 40 and then declines.

Table 5, column (b) shows the results of the logistic regression including the fieldworker's age and sex. Having an older fieldworker increased the probability of reporting ever taking an HIV test, while having a male fieldworker decreased the probability, though neither effect was significant.

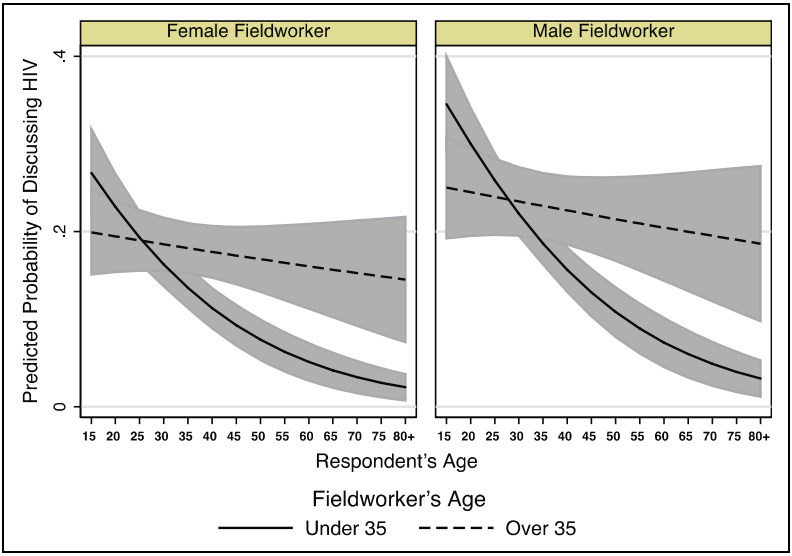

Figure 3. Predicted probability of discussing HIV with a partner using average marginal effects, Table 4, column (b), by respondent's and fieldworker's age, Agincourt, South Africa, 2010–2011.

Discussion

Our results show an effect of fieldworker age and sex across sexual behavior outcomes. Respondents report fewer sexual partners and more "responsible" sexual behavior with their partners to older interviewers. We also find, contrary to our hypothesis, that men report having more sexual partners to female interviewers. Our results show that men being interviewed by men and older fieldworkers look different than their counterparts being interviewed by women and by younger fieldworkers. This has implications for analyzing sexual behavior data, especially when the results may be significant but the (fieldworker) effects are obscured (Weinreb 2006).

Our results yield implications for future research, which we discuss together with our study limitations. First, we can only make assumptions about respondent reporting. To prove it, we would need data not currently available. Future studies might test for interviewer effects via means of randomization or experimental design to explore unmeasured or unrecognized patterns in respondents' reporting to different categories of interviewers. Analysts might also control for interviewer effects in their models and

Table 5. Logistic Regression of Ever Taken an HIV Test: (a) Base Model (Sociodemographic Characteristics and Village) and (b) Added Fieldworker Effects, Agincourt, South Africa, 2010–2011.

	(a) Base ($N = 4,467$)		(b) With Fieldworker Effects ($N = 4,467$)	
	OR	95% CI	OR	95% CI
Respondent age and sex				
Male	0.439***	[0.364, 0.528]	0.435***	[0.361, 0.524]
Age	0.937***	[0.929, 0.944]	0.937***	[0.929, 0.944]
Age^2	0.998***	[0.998, 0.998]	0.998***	[0.998, 0.998]
Age^3	1.000***	[1.000, 1.000]	1.000***	[1.000, 1.000]
Male × Age	1.065***	[1.053, 1.076]	1.065***	[1.053, 1.076]
Male × Age^2	0.999**	[0.999, 1.000]	0.999**	[0.999, 1.000]
Controls: village, SES, migration history				
Village				
1	—	—	—	—
2	1.201	[0.770, 1.872]	1.214	[0.778, 1.894]
3	0.966	[0.577, 1.618]	0.98	[0.585, 1.643]
4	1.554	[0.996, 2.425]	1.573*	[1.007, 2.457]
5	1.212	[0.748, 1.963]	1.217	[0.751, 1.972]
6	0.977	[0.477, 1.998]	0.984	[0.483, 2.005]
7	0.67	[0.402, 1.118]	0.677	[0.406, 1.130]
8	1.224	[0.822, 1.822]	1.215	[0.816, 1.809]
9	1.247	[0.750, 2.073]	1.261	[0.757, 2.103]
10	1.373	[0.714, 2.643]	1.352	[0.700, 2.610]
11	0.781	[0.438, 1.389]	0.791	[0.444, 1.411]
12	0.891	[0.573, 1.384]	0.889	[0.572, 1.381]
13	0.951	[0.541, 1.673]	0.956	[0.545, 1.676]
14	1.08	[0.581, 2.010]	1.08	[0.583, 2.004]
15	2.164*	[1.152, 4.064]	2.219*	[1.182, 4.165]
16	1.668	[0.993, 2.804]	1.66	[0.988, 2.789]
17	1.075	[0.627, 1.843]	1.08	[0.628, 1.855]
18	1.126	[0.534, 2.373]	1.145	[0.546, 2.405]
19	1.436	[0.946, 2.179]	1.426	[0.939, 2.166]
20	1.217	[0.781, 1.897]	1.224	[0.784, 1.912]
21	1.133	[0.724, 1.772]	1.144	[0.731, 1.790]
2009 SES quintiles				
First (lowest)	—	—	—	—
Second	1.155	[0.881, 1.514]	1.154	[0.881, 1.513]
Third	1.197	[0.917, 1.563]	1.198	[0.918, 1.565]

(continued)

Table 5. (continued)

	(a) Base ($N = 4,467$)		(b) With Fieldworker Effects ($N = 4,467$)	
	OR	95% CI	OR	95% CI
Fourth	1.143	[0.872, 1.499]	1.149	[0.876, 1.507]
Fifth (highest)	0.972	[0.752, 1.257]	0.969	[0.750, 1.251]
Past history of migration	0.948	[0.789, 1.137]	0.948	[0.790, 1.138]
Fieldworker × respondent effects				
Male fieldworker			0.956	[0.804, 1.137]
Aged 35+ fieldworker			1.101	[0.918, 1.320]

Note: CI = confidence interval; OR = odds ratio; SES = socioeconomic status.
*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed tests).

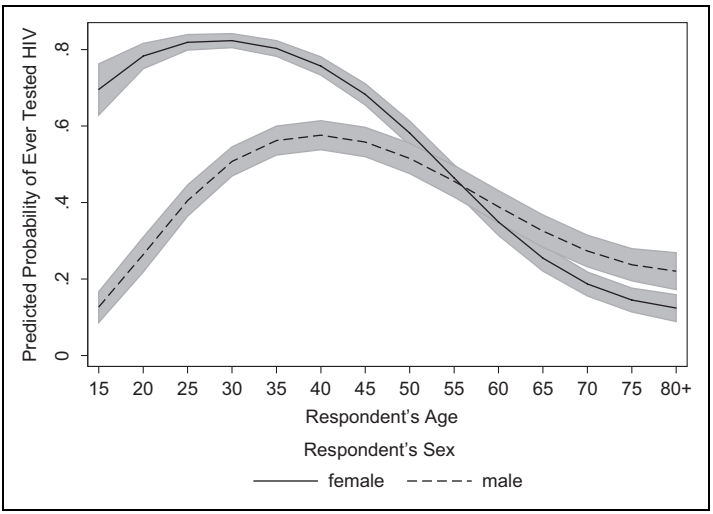

Figure 4. Predicted probability of ever taking an HIV test using average marginal effects, base model, Table 5, column (a), by respondent age and sex, Agincourt, South Africa, 2010–2011.

collect additional data on interviewer characteristics that could factor into future analyses. Additionally, it is unknown if missing respondents would vary systematically in their reporting of sexual behavior, although we introduced the study to sampled participants as one about diseases in the community that need chronic care, which may help minimize the potential for refusal bias.

Second, we do not have enough variability on interviewer characteristics to know if we are detecting other (unobserved) interviewer effects, such as community reputation, familiarity with the respondent's family, or perceptions of interviewer attractiveness (Jæger 2013). This is both a strength and weakness: While unknown interviewer characteristics may be obscured, our interviewers are similar on other characteristics such as ethnicity, education, and religion, suggesting we are *likely* identifying actual fieldworker (age and gender) effects. We also do not exploit the extent to which "role restricted interviewers' effects"—the influence of an interviewer's conduct on responses (e.g., particular greetings, the way they pose questions; Bignami-Van Assche et al. 2003)—affect our results. We tried to address this by using an indicator for each fieldworker when modeling each outcome. In one outcome, we found an outlying fieldworker: Responses to this fieldworker indicated a significantly higher probability of *discussing HIV with a partner* than other fieldworkers. We thus omitted that interviewer from the model. Fuller attention to role restricted interviewer effects requires greater data on the interview process itself. Finally, due to the small sample of fieldworkers, we were unable to explore additional interactions, such as fieldworker sex and fieldworker age, or respondent and fieldworker home village. Future research could examine the influence of these characteristics.

Third, our analysis of age must be interpreted conservatively. Perceptions of one's age are hard to decipher, and we do not know how respondents perceive the age of the interviewer. We also recognize that respondents over age 44 are older than our oldest interviewer. Given data limitations, we tried to account for this in our models: When it improved model fit, we included an interaction between the age of the respondent and the age of the interviewer. Our focus here, however, is on the significance of *social categories of age*, not of *age differences* between respondents and interviewers.

Finally, our results suggest that greater attention should be paid to the influence of interviewer embeddedness in the setting on study results. We did not include a measure for this in our analysis (we do not have it). We assume that all interviewers in our study are "insiders," as a requirement

for their employment with the AHDSS is that they live in the study area. This does not capture the degrees of ''insider-ness'' studied by Weinreb (2006), for example, who operationalized insiders as those who knew the respondents' family and strangers as those who did not and found insiders do a better job of collecting reliable data on sensitive topics such as family planning and AIDS (Weinreb 2006). We believe our study engages the debate about the possible pitfalls of interviewer insider-ness by demonstrating how other social characteristics of interviewers—age and gender—influence sexual behavior reporting where interviewers and respondents live in the same setting.

Interviewer characteristics—such as age and sex—cannot be ignored in data analysis on sensitive topics like sexual behavior and likely other value-laden topics. Their influences, however, may be culturally determined and thus important to analyze systematically for each setting (McCombie and Anarfi 2002). While it is beyond the scope of this article to explore the theoretical underpinnings of these social interactions, our study shows the need for increased attention to the influence of interviewer characteristics on the types of information that different categories of respondents report, and consequently, the data their interactions in the field research process produce.

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